

25X1

CORONA BRIEFING CHARTS

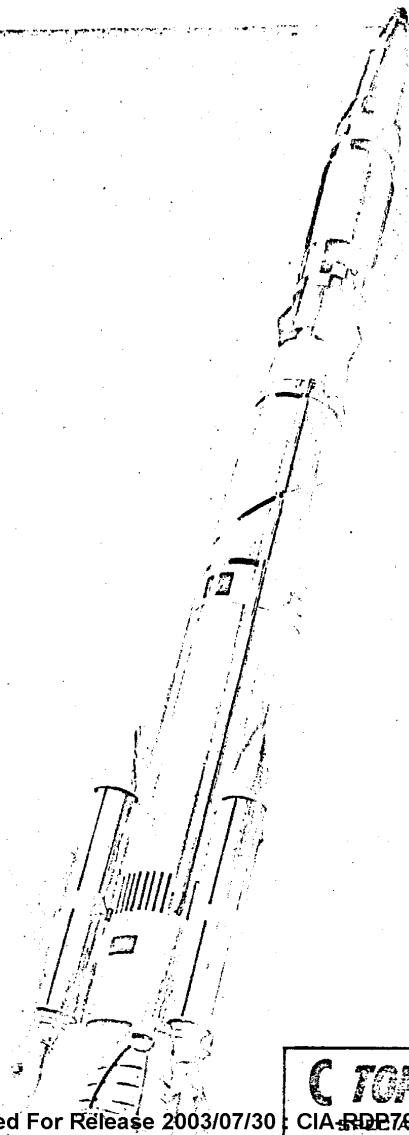
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NRO review(s)  
completed.

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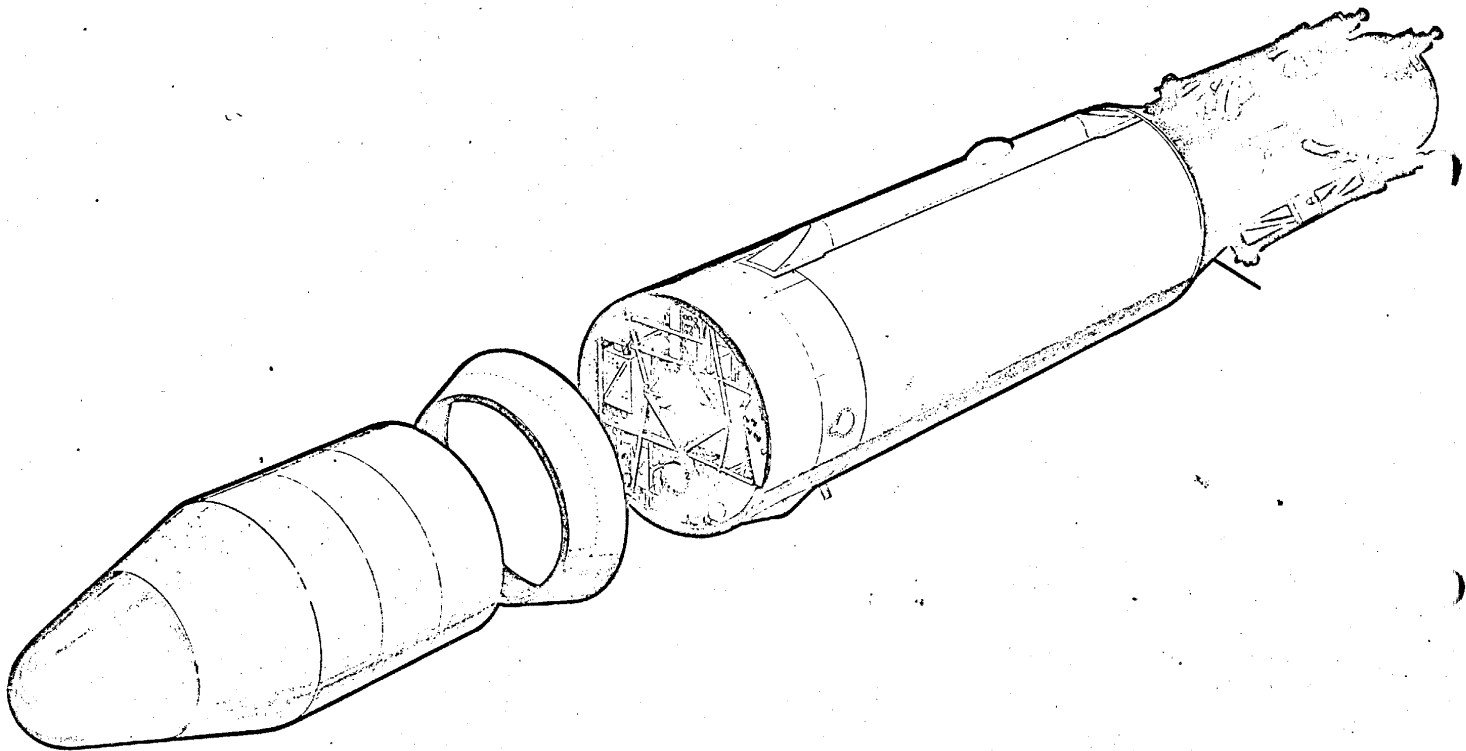
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# PROGRAM 241 VEHICLE

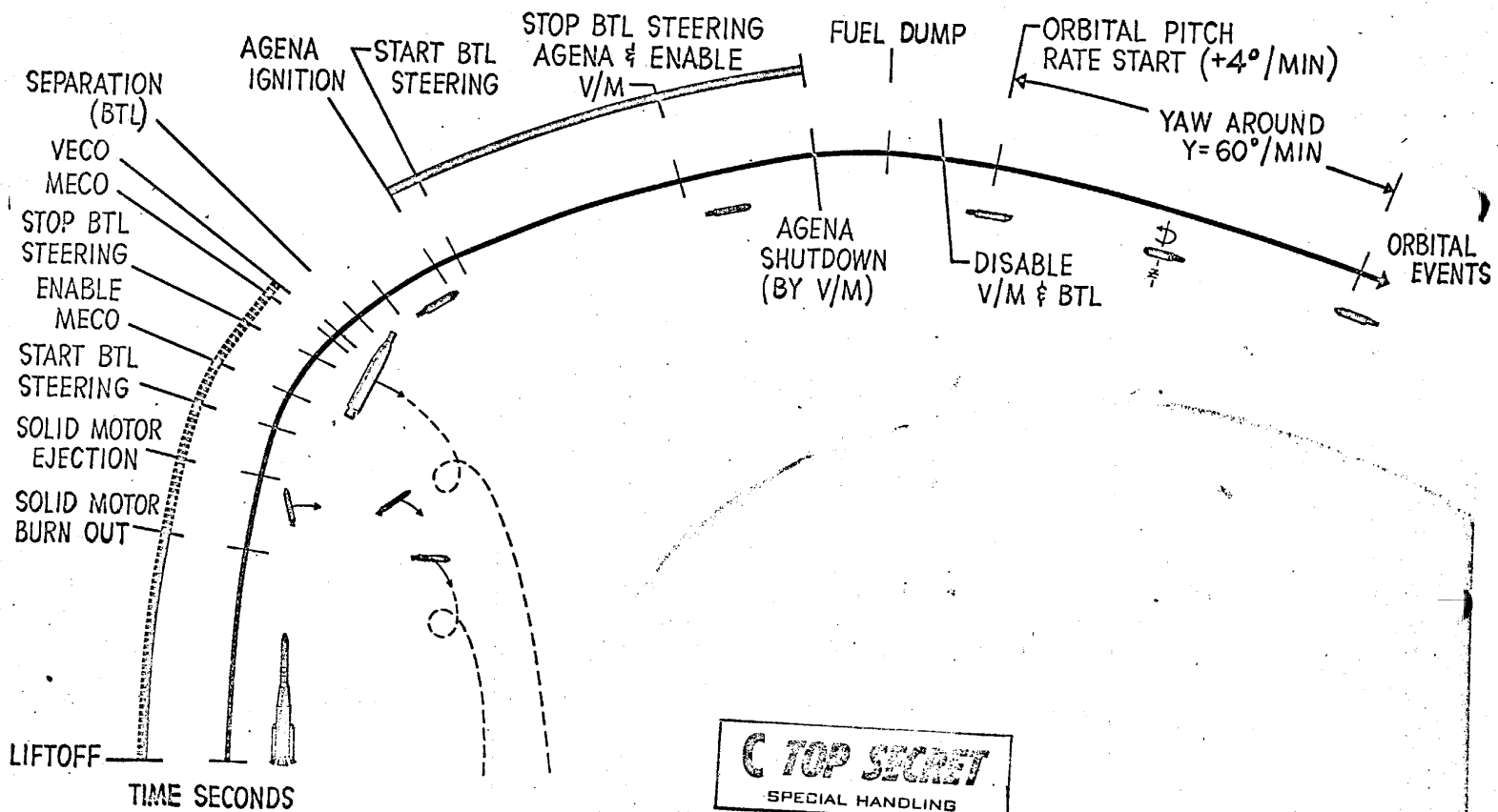


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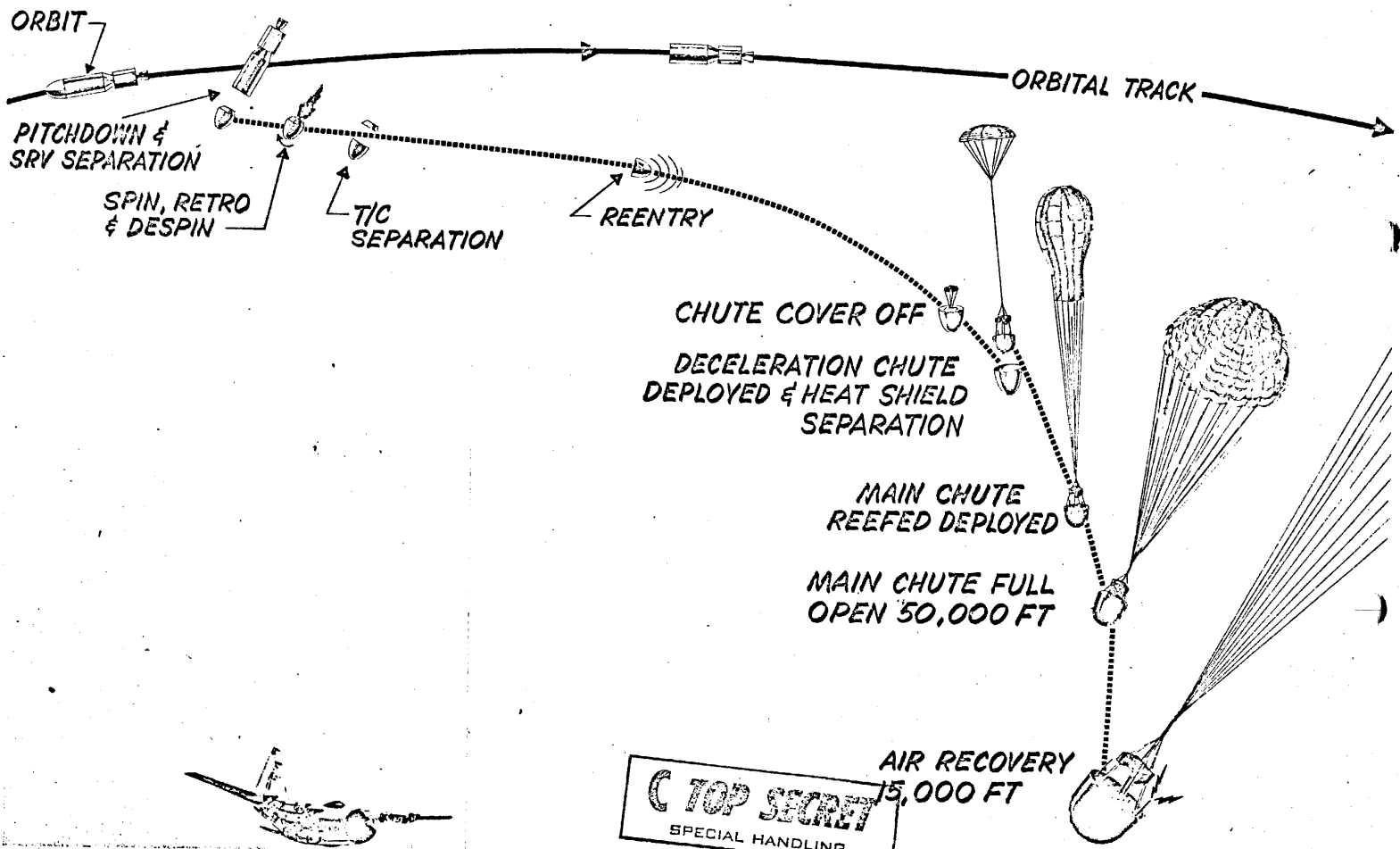
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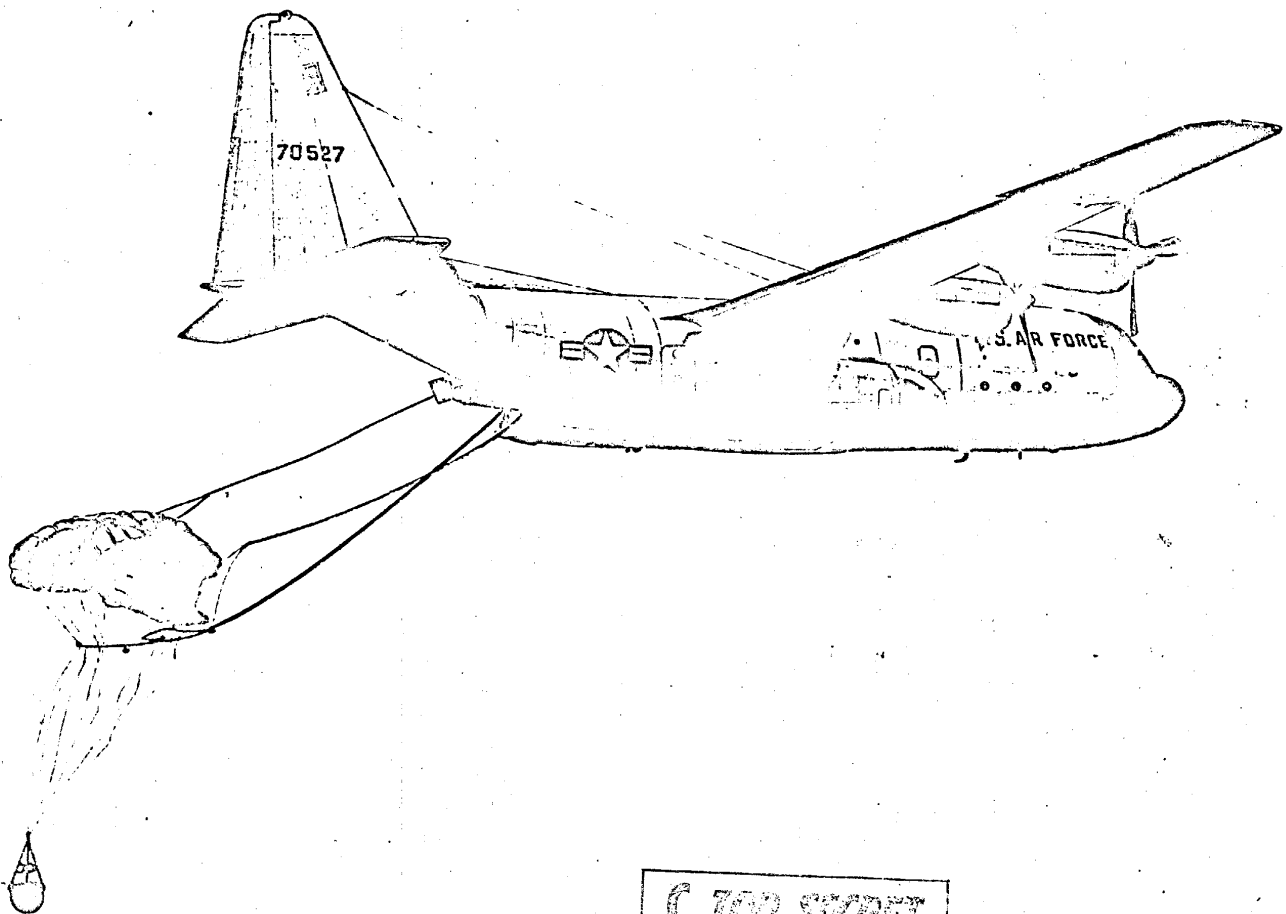
## ASCENT SEQUENCE OF EVENTS



## RECOVERY SEQUENCE OF EVENTS



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## C, PAYLOAD MISSION

### ○ PHOTOGRAPHIC SEARCH AND SURVEILLANCE (STEREO) UTILIZING:

- 2 SCANNING PANORAMIC CAMERAS - 24 INCH FOCAL LENGTH MOUNTED TO PROVIDE CONTINUOUS STEREO COVERAGE
- 2 RECOVERY SYSTEMS
- SYSTEM DEACTIVATE/REACTIVATE CAPABILITY
- EACH PANORAMIC CAMERA CARRIES 16,000 FT. OF 70MM FILM (-80 LBS.)
- TOTAL OPERATING TIME - 4.2 HRS. (APPROX.) COVERING 1000° LATITUDE (APPROX.) - STEREO

○ ORBITS - 4 TO 10 DAY REPETITIVE COVERAGE - 100 NM PERIGEE - 60° TO 96°  
INCLINATION ANGLE - 8 TO 11 DAY ACTIVE (POWER) LIFE

### ○ PHOTOGRAPHIC AND AUXILIARY DATA FOR DIA (MAPPING)

- DOUBLE STELLAR/INDEX CAMERA
- PANORAMIC GEOMETRY PROVISIONS
- POST FLIGHT ORBIT EPHEMERIS

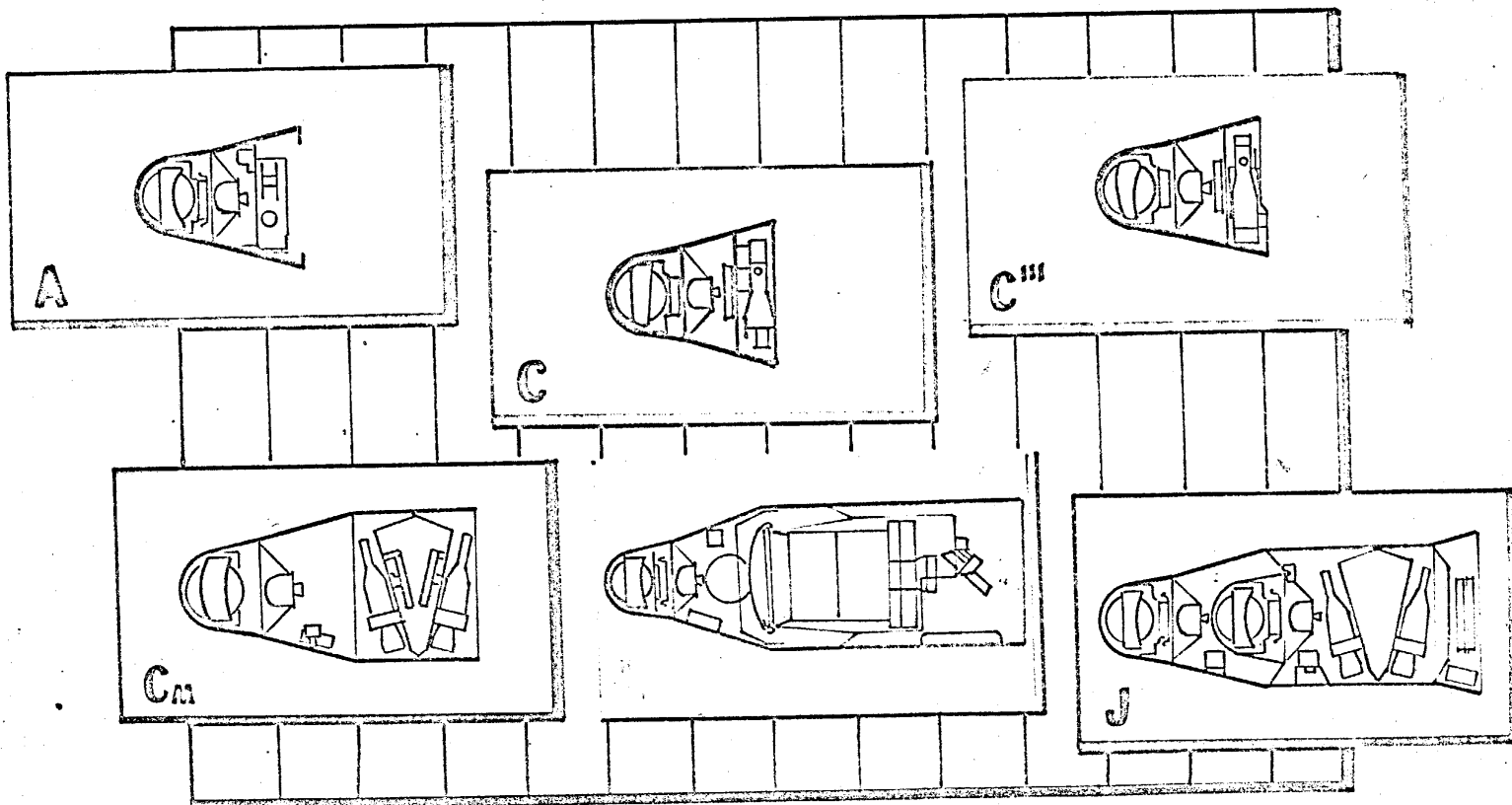
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## INBOARD PROFILES



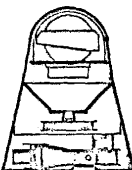
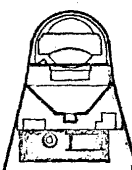
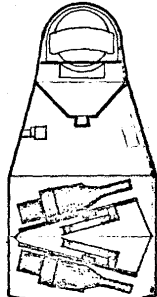
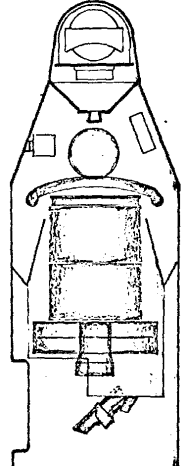
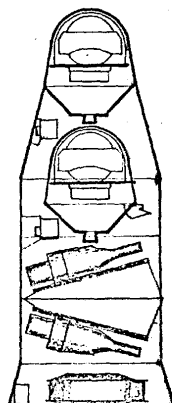
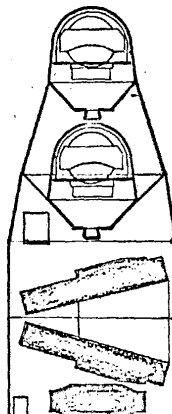
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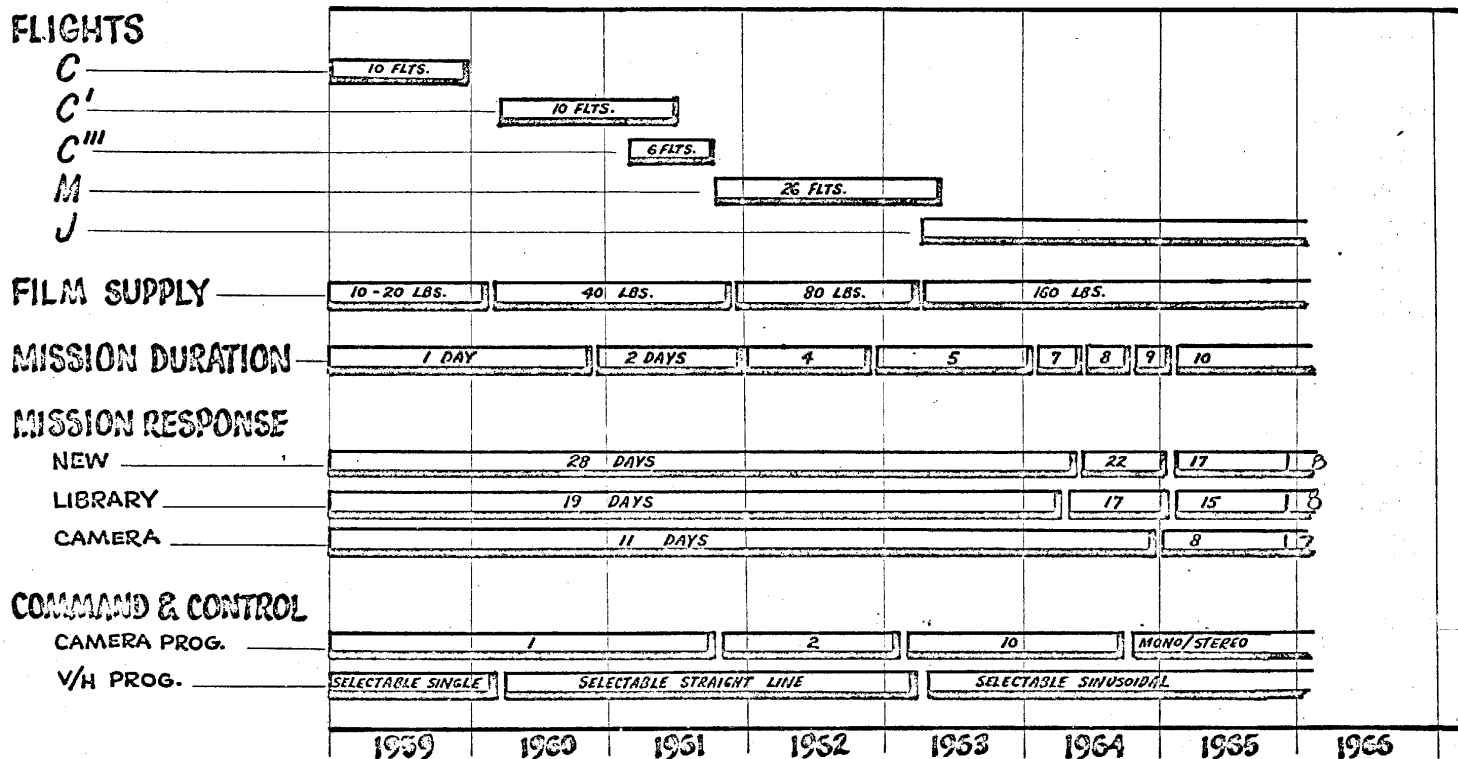
## PAYLOAD HISTORY

### CORONA

| PAYLOAD (FILM) WEIGHTS  |   |   |  |   |   |  |
|---|---|---|--|---|---|--|
| 40 LBS.   | 40 LBS.   | 80 LBS.   | 80 LBS.  | 160 LBS.  | 160 LBS.  |  |
|  |  |  |  |  |  |  |
| CORONA<br>C   | ARCON<br>A  | MICHEL<br>M   | LAMARDO<br>L   | J   | J3  |  |

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## CORONA PROGRAM EVOLUTION



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## PROGRAM ACCOMPLISHMENTS (U)

- FIRST POLAR ORBITING SATELLITE 2-28-59
- FIRST SATELLITE STABILIZED ON ALL THREE AXES 4-13-59
- FIRST SATELLITE PROGRAMMED TO CHANGE ATTITUDE ON ORBIT 4-13-59
- FIRST SURFACE RECOVERY OF SATELLITE PAYLOAD 8-10-60
- FIRST AIR RECOVERY OF SATELLITE PAYLOAD 8-18-60
- FIRST ENGINE RESTART ON ORBIT 2-18-61
- FIRST DUAL RECOVERY 2-18-64 & 2-22-64

### OPERATIONAL DEVELOPMENTS

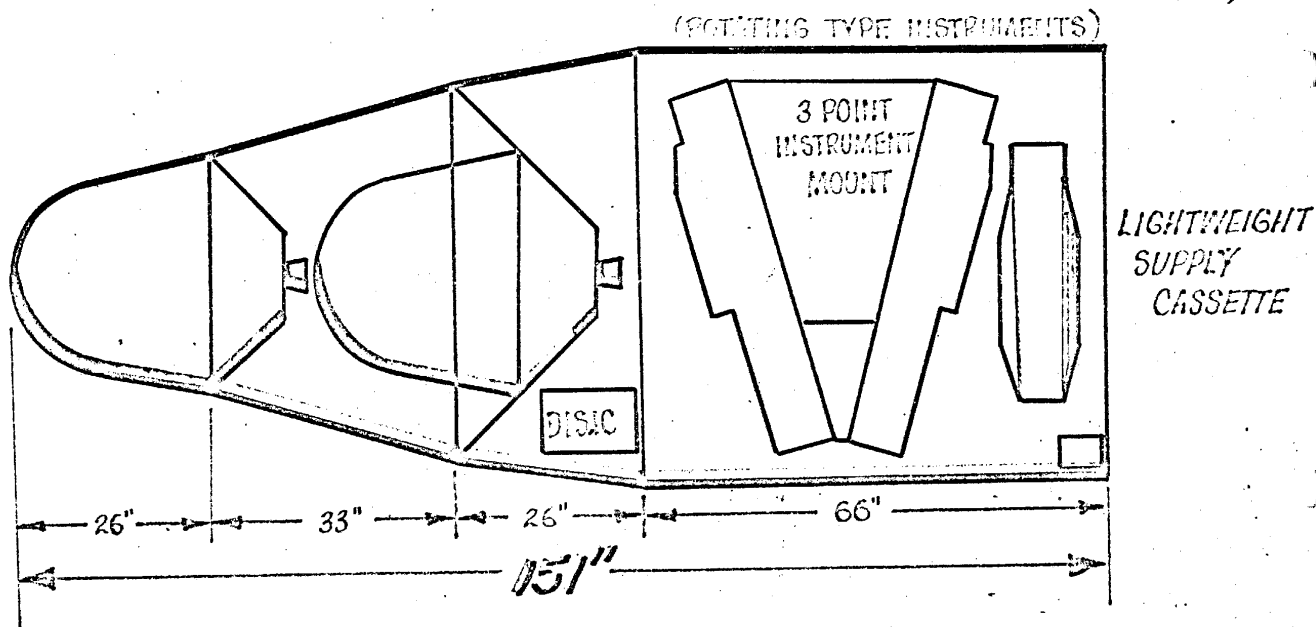
- INCREASED OPERATING ON ORBIT LIFE FROM 1 TO 9 DAYS
- DEACTIVE-REACTIVATE CAPABILITY
- THRUST AUGMENTED THOR INTRODUCTION
- PIGGY-BACK & FIRST OPERATIONAL FLIGHTS OF ALL NEW & IMPROVED AGENA EQUIPMENTS
- IMPROVED AIR RECOVERY EQUIPMENT AND TECHNIQUES
- IMPROVED PAYLOAD CAPABILITY
- PAYLOAD WEIGHT INCREASED FROM 330 LBS. TO 1600 LBS
- PAYLOAD VERSATILITY INCREASED

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|            | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | TOTALS |
|------------|------|------|------|------|------|------|------|--------|
| LAUNCHES   | 8    | 11   | 17   | 22   | 17   | 15   | (1)  | 90     |
| RECOVERIES | 0    | 4    | 7    | 16   | 12   | 23   |      | 62     |

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## J<sub>3</sub> CONFIGURATION

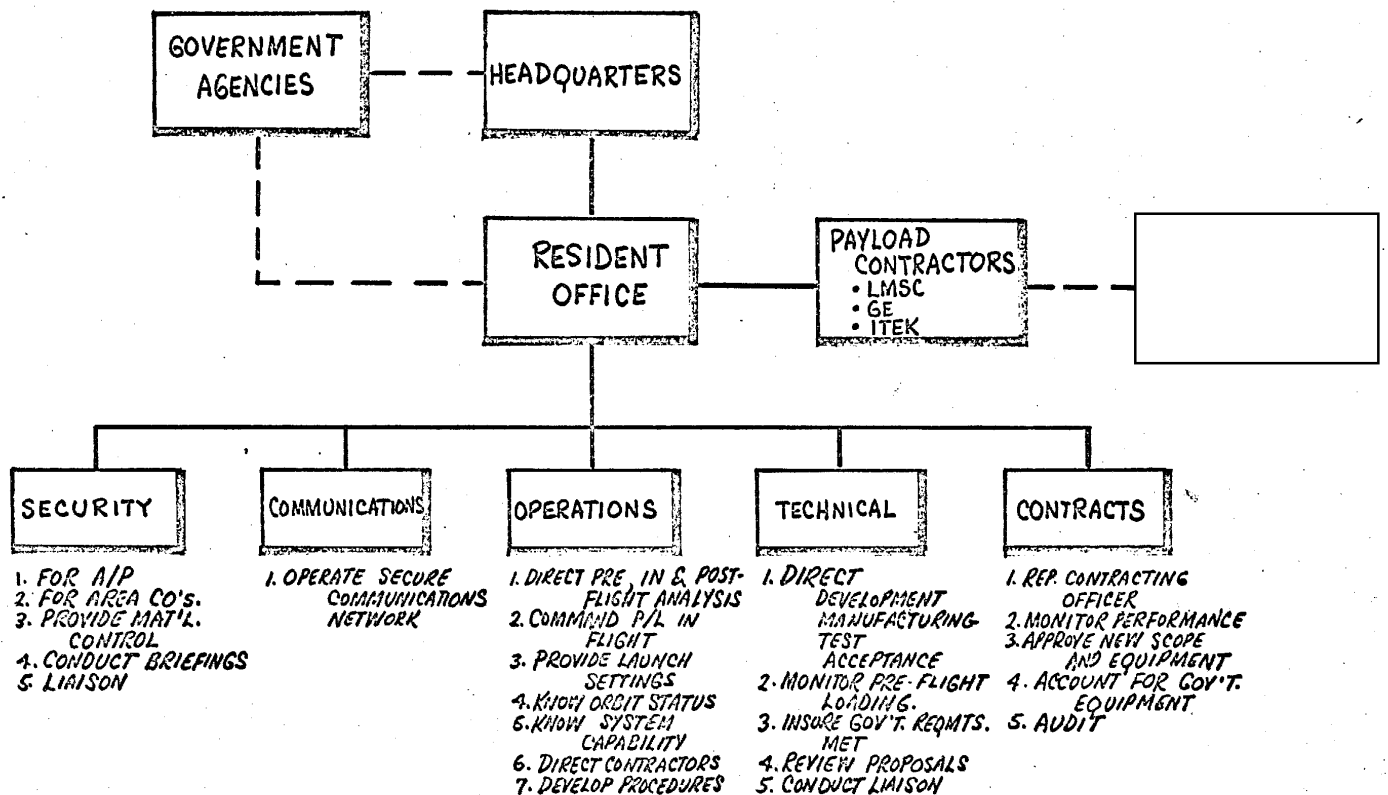


ESTIMATED PAYLOAD WEIGHT — 1658

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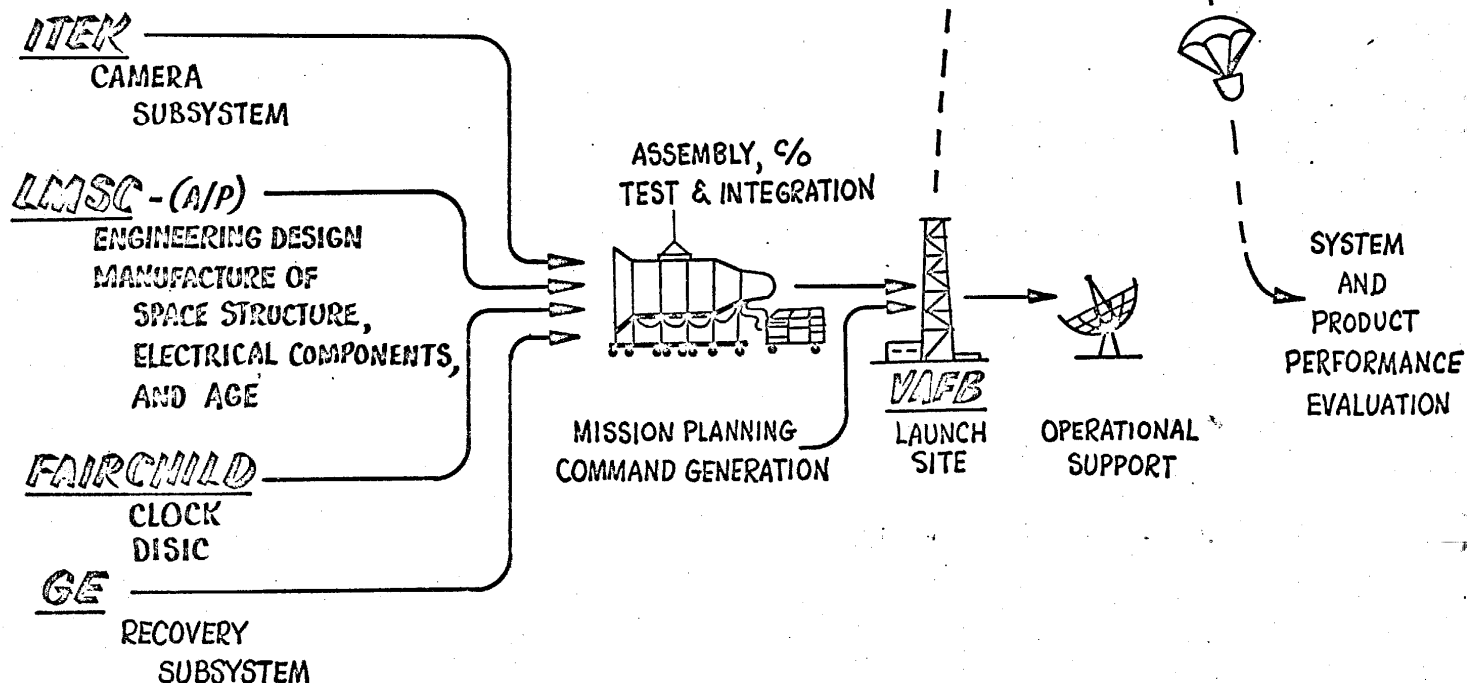
## PAYLOAD ORGANIZATION & FUNCTIONS



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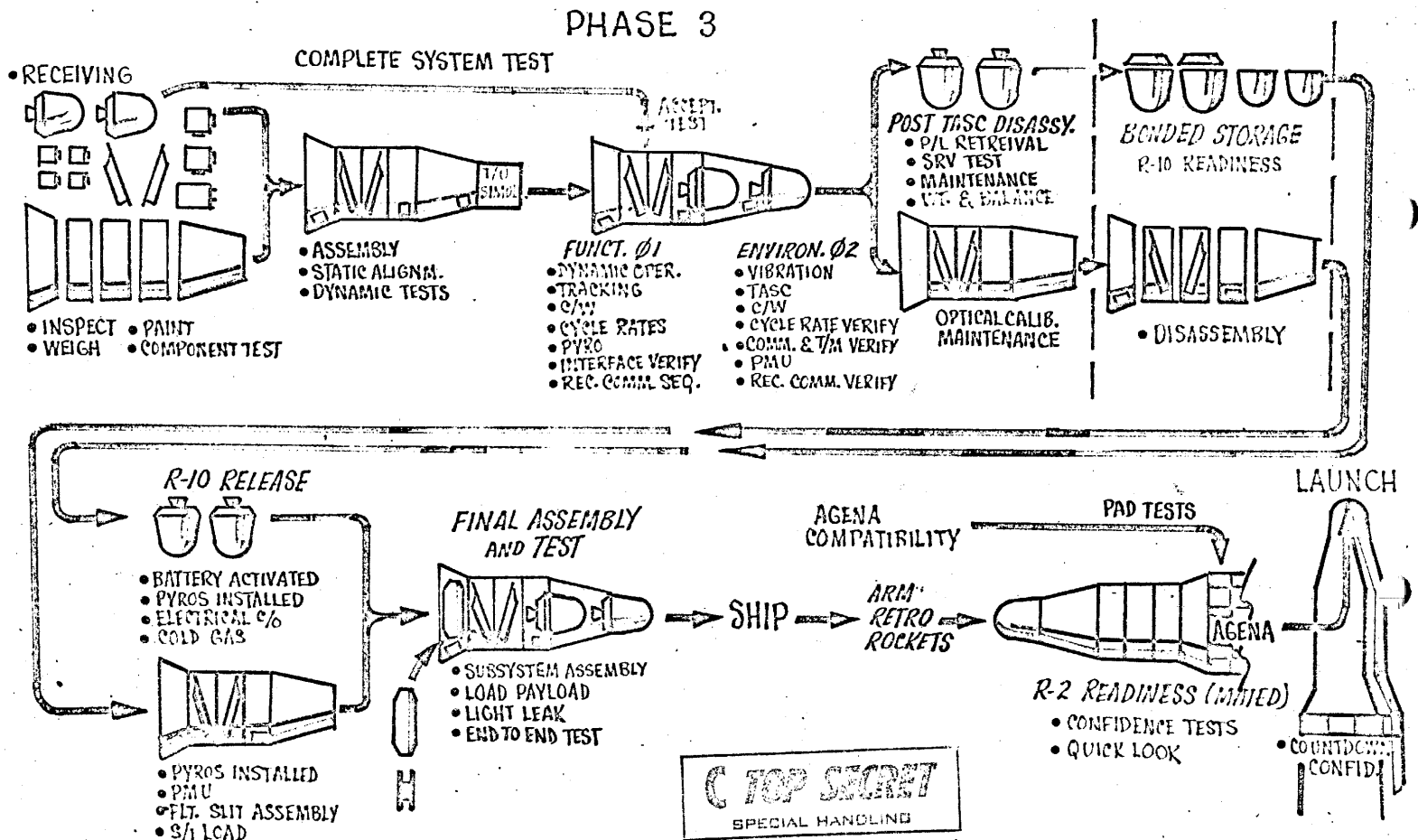
## ADVANCED PROJECTS



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# FACTORY TO LAUNCH FLOW CHART



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## OPERATIONAL CONTROL PHILOSOPHY

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- NINE DIFFERENT CAMERA PROGRAMS ARE PREPARED AND STORED IN THE VEHICLE ORBITAL PROGRAMMER PRIOR TO FLIGHT
- POSSIBLE AREAS FOR MONOSCOPIC COVERAGE ARE DESIGNATED AND STORED IN THE ORBITAL PROGRAMMER PRIOR TO FLIGHT
- DURING FLIGHT THE SATELLITE OPERATIONS CENTER MATCHES TARGETING REQUIREMENTS TO FORECASTED WEATHER AND SELECTS DESIRED CAMERA PROGRAM, ACTIVE AND PASSIVE ORBITS AND CAMERA OPERATING MODE (STEREO OR MONO)
- OPERATIONS REQUIREMENTS FROM SATELLITE OPERATIONS CENTER ARE TRANSLATED INTO VEHICLE REAL TIME COMMANDS, COMMANDING CONTROLLED FROM STC

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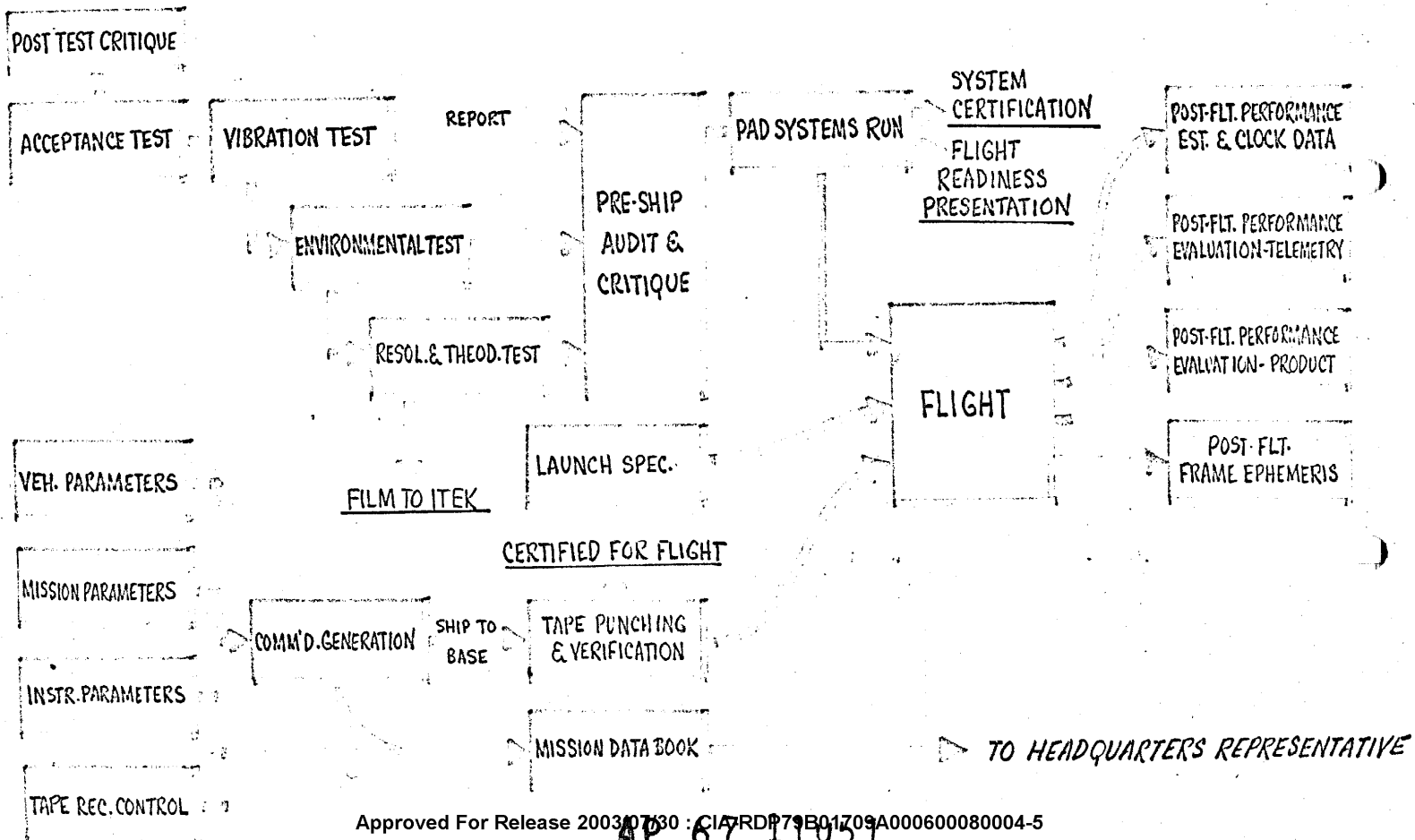
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## FUNCTIONAL FLOW DIAGRAM

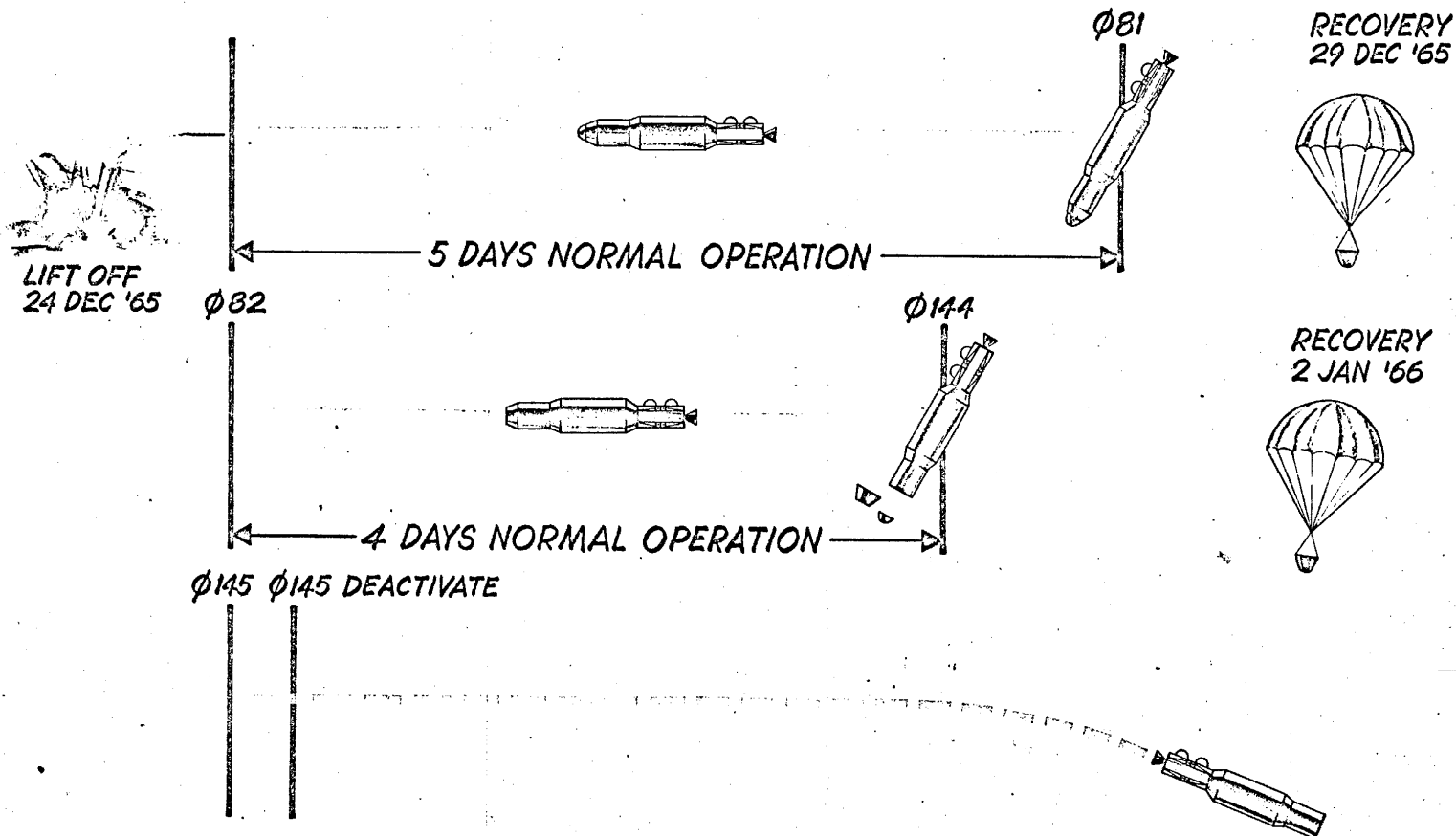


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## 1610 FLIGHT PROFILE



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## IMPROVEMENT GOALS

### IMPROVED PRODUCT QUALITY

- INCREASED SCALE THROUGH LOWER MEAN ALTITUDE
- IMPROVED DYNAMIC BALANCE

### INCREASED COVERAGE ACCESS

- EXTEND ACTIVE MISSION DURATION

### INCREASED COVERAGE

- MORE FILM

### REDUCED PROGRAM COSTS

- MORE COVERAGE AND QUALITY PER \$

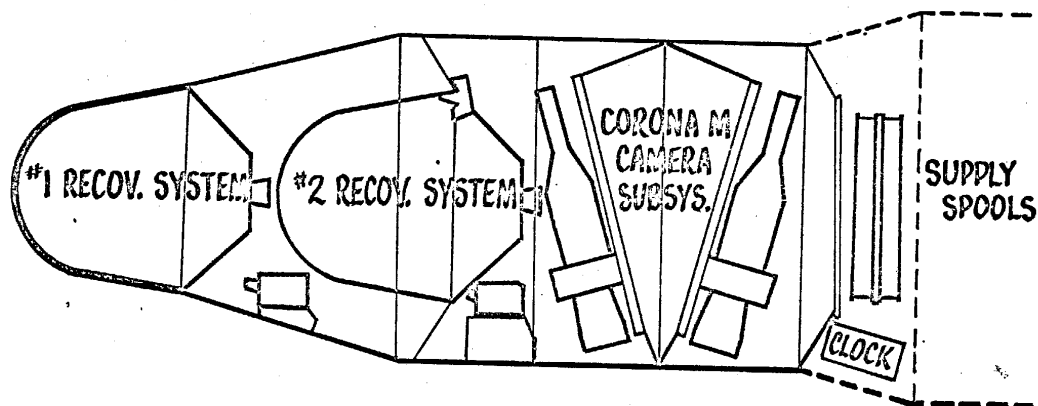
### IMPROVED STELLAR/INDEX PERFORMANCE

- INCREASED SCALE AND RESOLUTION OF INDEX PHOTO (NEW LENS)
- INCREASED OPERATIONAL FLEXIBILITY BY DUAL STELLAR CAPABILITY
- PROVIDE INDEPENDENT PROGRAMMING FOR MAPPING

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## C<sub>J</sub> INBOARD PROFILE



PERFORMANCE AT 125 NM  
SO-132 125 L/MM 10'  
COVERAGE 13.6 M NM<sup>2</sup>/FLT.  
STEREO

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**NRO**

National Reconnaissance Office

**DATA BOOK**

# THE KH-4B CAMERA SYSTEM

PUBLISHED BY  
NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER  
SEPTEMBER 1967

Group 1 Excluded from Automatic  
Downgrading and Declassification

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WARNING

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3 OCT  
3 1967



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## **PREFACE**

This data book has been prepared by the National Reconnaissance Office with the assistance of the National Photographic Interpretation Center to provide general technical information pertinent to the reduction of data obtained by the KH-4B camera system.

The KH-4B camera system is expected to be operational in the fall of 1967. This photographic system is a continuation of the KH-4 series with modifications to provide adjustable exposure control, selectable filters, and a change in the mechanism which provides image motion compensation as well as a 3 inch focal length terrain camera.

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## INTRODUCTION

This data book incorporates the latest modification to the basic KH-4 camera system. The KH-4B camera system consists of 2 main panoramic cameras, a stellar/index camera and 4 horizon cameras (Fig 1). The payload consists of 2 recoverable sub-systems, each containing approximately 16,000 ft of film (8,000 ft of film per camera). The 2 recoverable sub-systems are designated mission part 1 and mission part 2. The system may be used to meet either reconnaissance or cartographic objectives. The camera (Fig 1) is oriented so that the forward camera in the vehicle is the aft looking, and the aft camera is the forward looking.

## PANORAMIC CAMERAS

Each panoramic camera is mounted in the photographic vehicle at a 15 degree angle from the vertical, thus forming a 30 degree convergence angle. The cameras are designated as forward-looking and aft-looking.

## Panoramic Camera Data

Table 1. Panoramic Camera Data

|                                 |   |
|---------------------------------|---|
| Lens                            | Petzval f/3.5 T/3.8   |
| Focal Length                    | 609.602mm (24.0 in)   |
| Scan Angle                      | 70 deg ( $\pm 35$ deg from track)   |
| Field of View                   | 5.12 deg (along track)  |
| Usable Format                   | 29.323" X 2.147"  |
| Shutter                         | Focal Plane   |
| Slit Widths                     | Variable--from 0.17 in to 0.30 in   |
| Film Load                       | 1. 70mm wide<br>2. 8,000 ft per recoverable sub-system (part 1 or 2 of a mission) for each camera<br>3. 16,000 ft per recoverable sub-system<br>4. 16,000 ft per camera per mission<br>5. 32,000 ft total load for both cameras for a mission (parts 1 and 2) |
| End Lap                         | 7.6%  |
| Image Motion Compensation (IMC) | Camera nods proportional to velocity/height (V/H) ratio   |
| Stereo Angle                    | 30.46 degrees   |
| Filter                          | Variable -2 position commandable  |
| Film Type                       | 3404, Estar Base  |

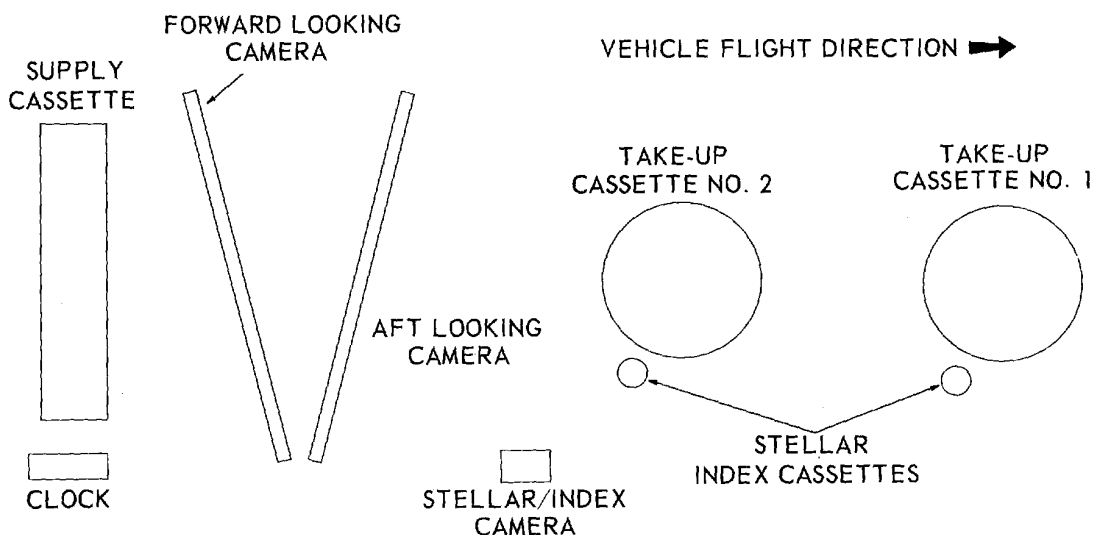


FIGURE 1. CAMERA SYSTEM CONFIGURATION.

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## Binary Values in Milliseconds

|                       |           |
|-----------------------|-----------|
| Least Significant Bit | 1         |
| Nearest the Takeup    | 2         |
| end of the format.    | 4         |
|                       | 8         |
|                       | 16        |
|                       | 32        |
|                       | 64        |
|                       | 128       |
|                       | 256       |
|                       | 512       |
|                       | 1024      |
|                       | 2048      |
|                       | 4096      |
|                       | 8192      |
|                       | 16384     |
|                       | 32768     |
|                       | 65536     |
|                       | 131072    |
|                       | 262144    |
|                       | 524288    |
|                       | 1048576   |
|                       | 2097152   |
|                       | 4194304   |
|                       | 8388608   |
|                       | 16777216  |
|                       | 33554432  |
|                       | 67108864  |
|                       | 134217728 |
| Most Significant Bit  | 268435456 |
| Nearest the Supply    |           |
| end of the format.    |           |

## Format Characteristics

Figure 2 is a complete record of the format for the forward looking and aft looking panoramic cameras. The following is a description of the various items on the film.

1. Camera Serial Number -- An imaged record of the camera manufacturer's serial number. An even number indicates the aft looking camera. An odd number indicates the forward looking camera.

2. Binary Time Word -- A recording of vehicle clock time to the nearest millisecond. The time word contains 29 bits plus a parity bit. There are six columns of 32 bits available, but only three columns of 30 binary bits are presently used as shown in Figure 3. The column nearest the film edge is column number one, and all 30 bits are illuminated to provide a registration for mechanical readout. Column two presents the time word in rows 1 through 29 with the 30th being the parity bit. Column three presents reciprocated time, again with the 30th bit being the parity bit. The data block is located outside the platen area on the takeup side. This means that any time readout, as seen on the film, is associated with the following (next higher number) frame, or conversely, when ascertaining the time a particular frame was taken, it is necessary to look at the data block on the previous or lower numbered frame.

3. Titling Data -- The title is affixed crossway on the film between frames and consists of a pass number, frame number, an arrow (indicates frame to which title applies), mode (S for stereo, M for mono, or MS for mixed), date, mission number, camera (fwd or aft-looking), and classification. The letters D, A, and M, preceding the pass number have the following meanings:

- a. D -- The pass is descending from north to south.
- b. A -- The pass is ascending from south to north.
- c. M -- The pass is mixed; ascending and descending.

An E added to the end of a pass indicates an engineering operation

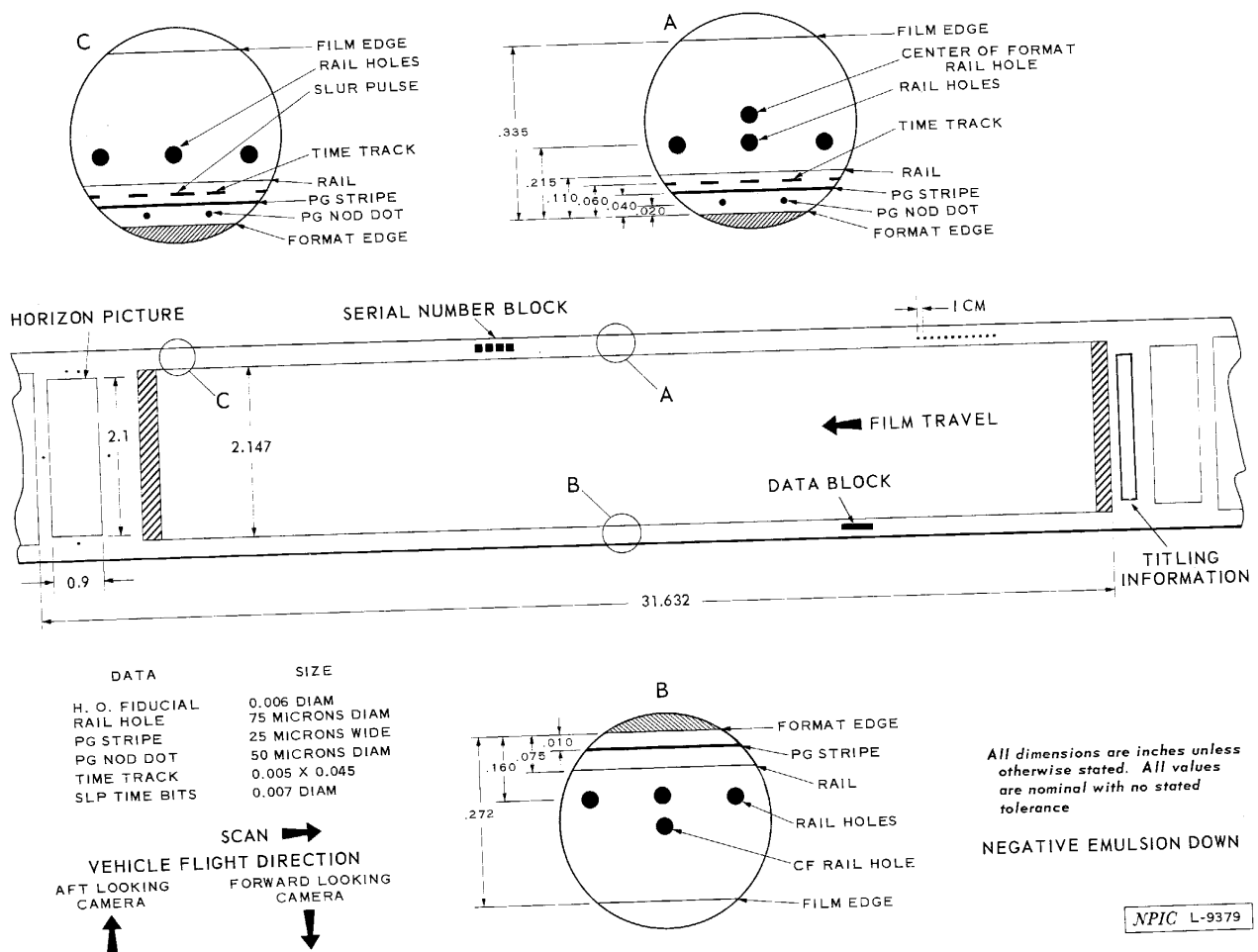
4. Panoramic Geometry Traces -- lines on either side of the format which aid in determining the locus of principal points of the lens.

5. A nod angle calibration system which, by means of a xenon flash triggered by an optical encoder mounted on the nod axis, images a series of small dots along the edge of the format.

6. Pan Geometry Fiducial Marks -- An image of the 73 holes through the film guide

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*Table 2. Panoramic Camera Calibration*

| COMPONENT       | PARAMETER                                | CALIBRATION                                       |
|-----------------|--|---|
| Main Lens       | Equivalent Focal Length                  | 25 Microns  |
| Main Lens       | Radial Distortion                        | 1 Micron  |
| Main Lens       | Convergence                              | 60 ARC Seconds                                    |
| Horizon Optics  | Equivalent Focal Length                  | 25 Microns  |
| Horizon Optics  | Principal Point to Fiducial Intersection | 10 Microns  |
| All Lens        | Alignment Horizon to Pan and Pan to Pan  | 60 ARC Seconds                                    |
| Nod dot encoder | Nod angle position                       | One dot every 19.78 arc sec of nod shaft rotation |

rails. Each hole is approximately 40 microns in diameter spaced at 1 centimeter intervals with a double hole at the center of format.

7. Time Track -- An image of a 200 cycle per second light pulse which records the camera lens scan rate.

8. Slur Time Pulse -- A stretched pulse which occurs immediately after the clock is interrogated in order to show the relation between the time marks and the clock time. This should permit the determination of the time at which a point on the format was exposed with accuracy of 2.5 milliseconds (3 sigma).

9. Start of Operation Indicator -- A cross imaged near the camera serial number on the last frame of the previous camera operation.

focal length, and checking the lens distortion characteristics. Subsequent to this, each camera system is calibrated to determine the position of the horizontal cameras in relation to their respective panoramic camera lens. The accuracy of these calibrations is shown in Table 2.

### HORIZON CAMERAS

Two horizon cameras are associated with each panoramic camera. The imagery from the horizon cameras is used to determine the attitude (pitch and roll) of the main panoramic cameras. The paired horizon cameras will operate simultaneously on alternate panoramic frames. The horizon camera formats are exposed adjacent to the main panoramic frames (Figure 2).

### Coverage

Figure 4 shows the angles covered by the several cameras. Figure 5 shows the typical terrain coverage expected and lists the coverage for various altitudes. Figure 6 is a conversion chart to determine photographic scale at different distances from the format center over the altitude range from 80 to 120 nautical miles.

### Camera Calibration

The panoramic camera lenses and horizon cameras are individually calibrated prior to being mounted on the panoramic camera. This individual calibration consists of determining the principal point of autocollimation and the equivalent

### Horizon Camera Data

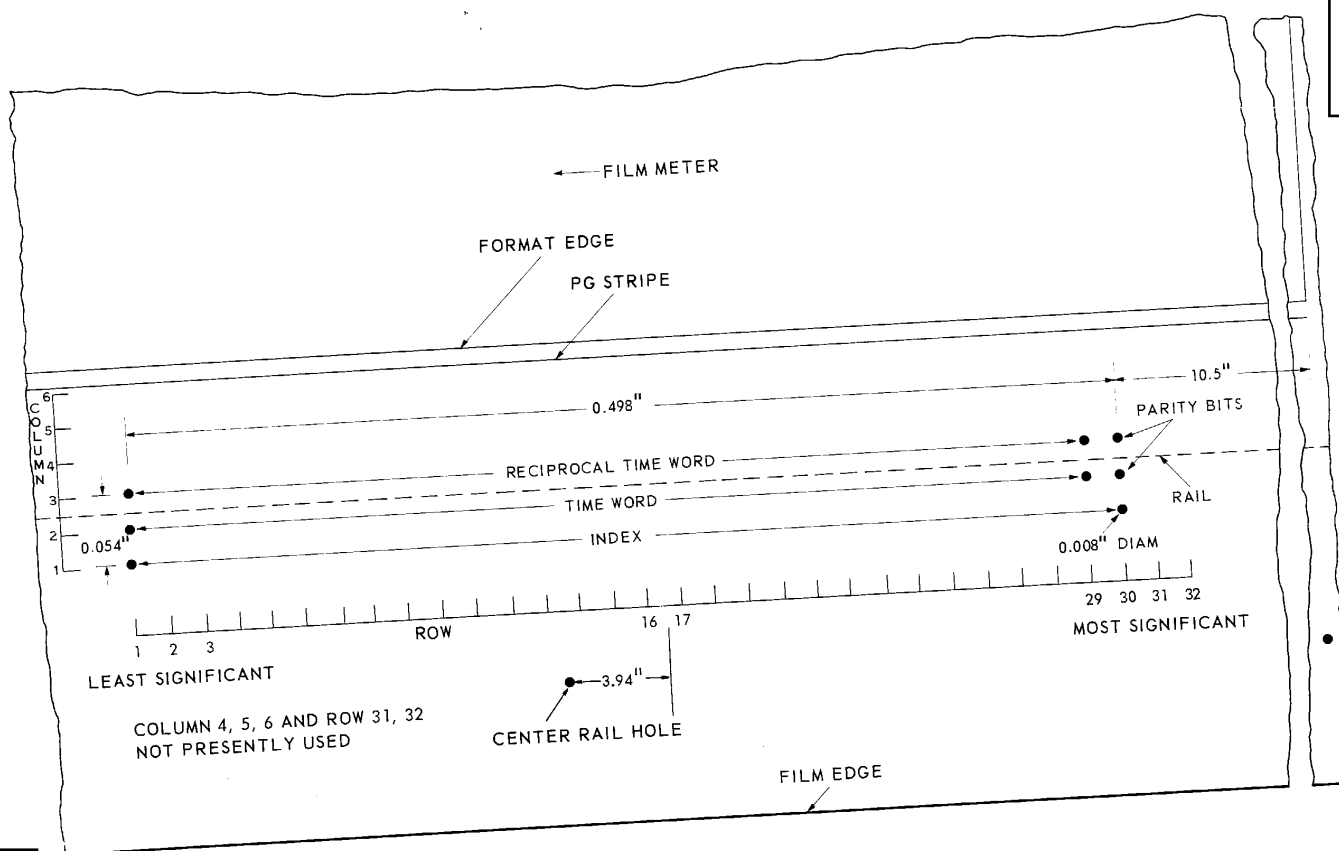
*Table 3. Horizon Camera Data*

|                       |  |
|-----------------------|--|
| Focal Length          | 55mm   |
| Depression Angle      | 15 deg   |
| Filter                | Wratten 25 plus Commandable Attenuator   |
| Exposure              | 1/100 sec.   |
| Film Type             | Same as main panoramic cameras   |
| Angular Field of view | Approximately 51 deg 44 min by 23 deg 28 min   |
| Usable Format         | 2.1 X 0.9 in   |
| Aperture              | f/6.8 or f/8.0 -- varies according to which cameras are primarily pointing toward or away from the sun |

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NEGATIVE EMULSION DOWN

FIGURE 3. DATA BLOCK FORMAT.

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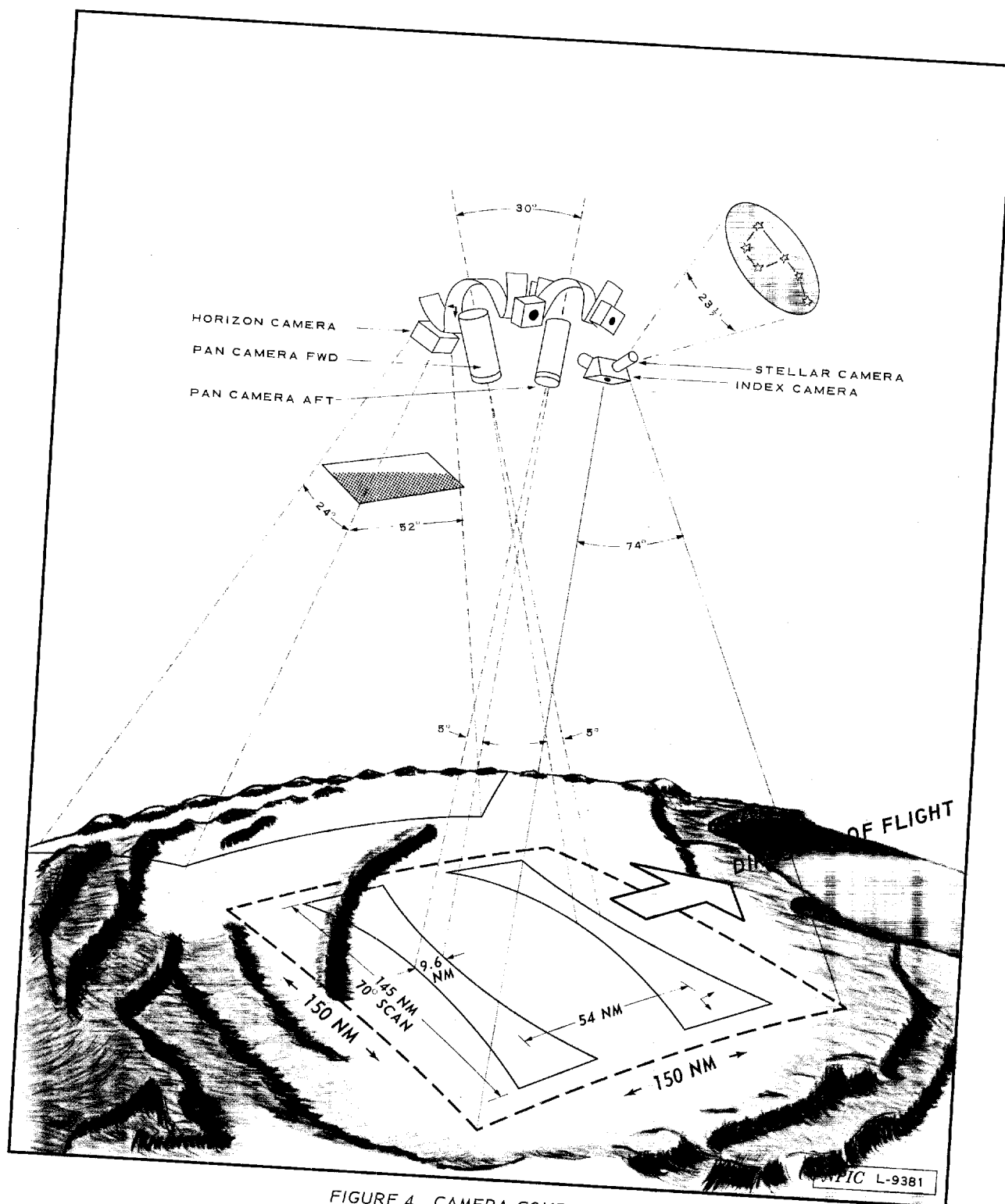


FIGURE 4. CAMERA COVERAGE.

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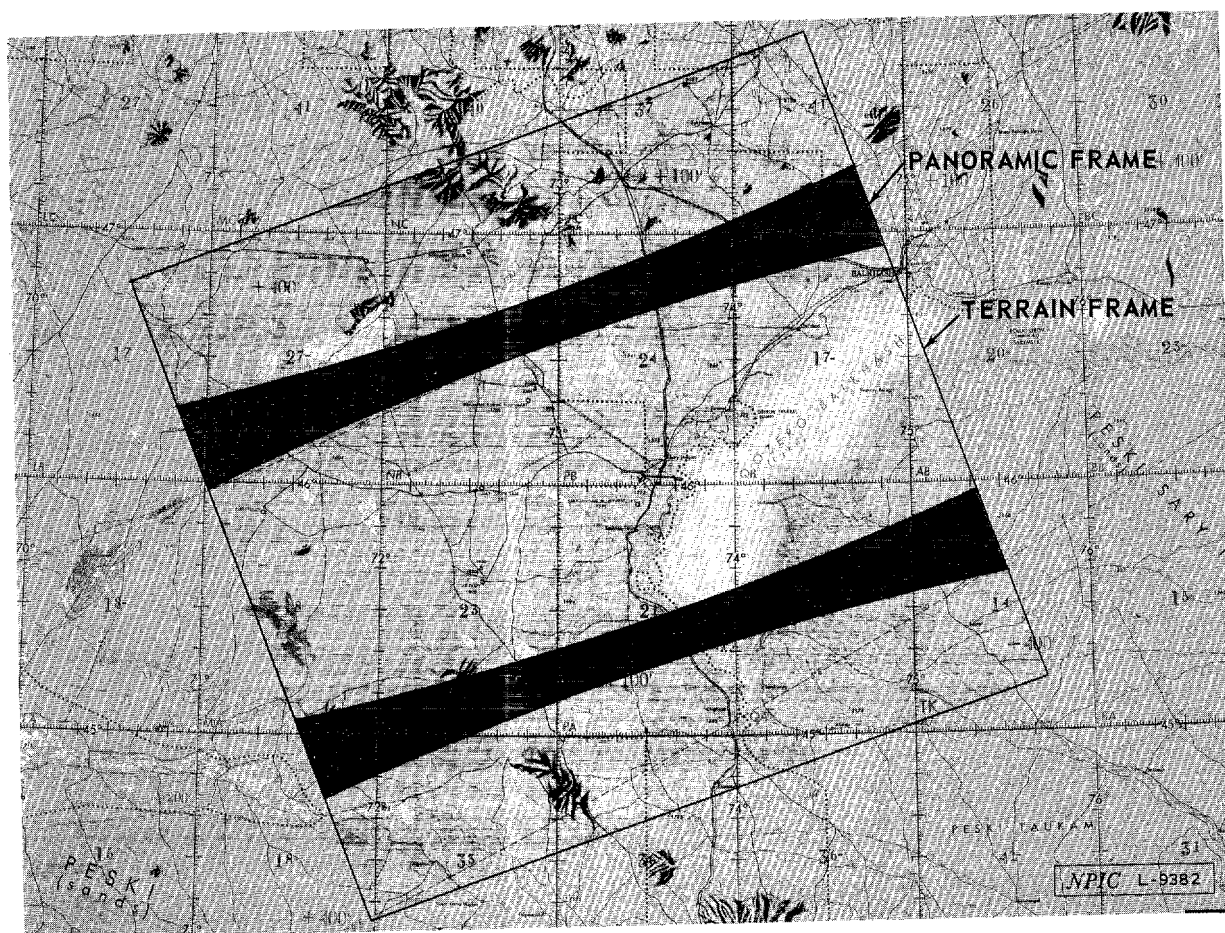


FIGURE 5. PANORAMIC AND TERRAIN CAMERA COVERAGE.

## PANORAMIC CAMERA SYSTEM COVERAGE

| Altitude (n.m.)                                    | 80    | 85    | 90    | 95    | 100   | 105   | 110   | 115   | 120   |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Frame forward cover (n.m.)                         | 7.7   | 8.2   | 8.6   | 9.1   | 9.6   | 10.1  | 10.6  | 11.0  | 11.5  |
| Frame width cover (n.m.)                           | 117.0 | 124.0 | 131.0 | 139.0 | 146.0 | 154.0 | 161.0 | 168.0 | 176.0 |
| Area pr. fr. (sq. n.m. x 10 <sup>2</sup> )         | 8.9   | 10.0  | 11.3  | 12.5  | 13.9  | 15.3  | 16.8  | 18.4  | 20.0  |
| Mission stereo cover (sq. n.m. x 10 <sup>6</sup> ) | 4.9   | 5.6   | 6.2   | 7.0   | 7.7   | 8.5   | 9.3   | 10.2  | 11.1  |
| (3 mil base film)                                  |       |       |       |       |       |       |       |       |       |

## TERRAIN CAMERA COVERAGE

A listing of the coverage and overlap of the terrain camera is shown below for selected altitudes between 80 n.m. and 120 n.m.

| Altitude (n.m.)                                    | 80    | 90    | 100   | 110   | 120   |
|--|-------|-------|-------|-------|-------|
| Side dimension of ground pattern - n.m.            | 120.6 | 135.6 | 150.7 | 165.8 | 180.8 |
| Area coverage pr. fr. - sq. n.m. x 10 <sup>4</sup> | 1.45  | 1.84  | 2.27  | 2.75  | 3.27  |
| Overlap - % 9.375 sec/cycle                        | 68.0  | 71.6  | 74.4  | 76.7  | 78.7  |
|  | 57.4  | 62.1  | 65.9  | 69.0  | 71.6  |

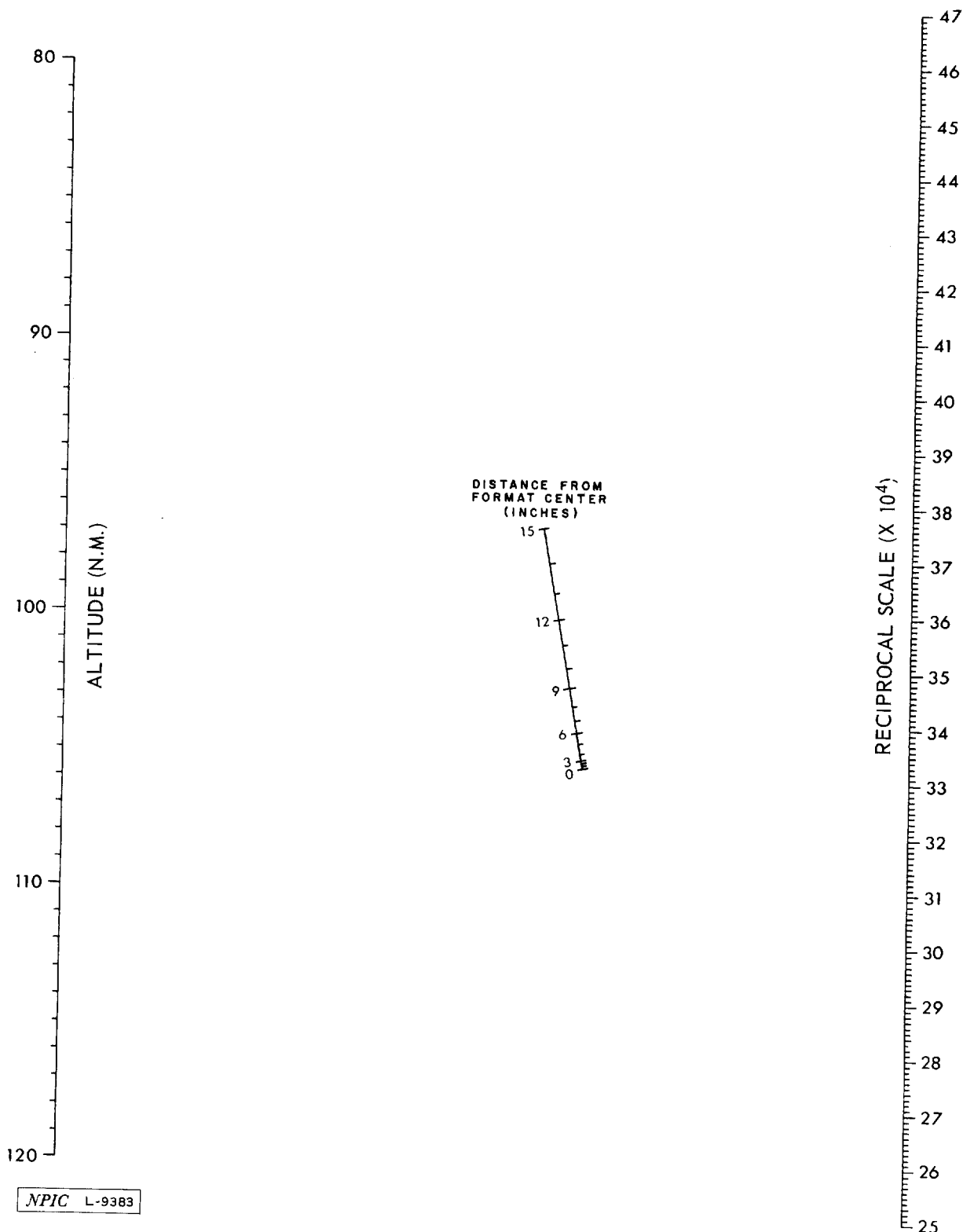
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FIGURE 6. SCALE CONVERSION.

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The horizon camera photographs have no specific scale associated with them, nor do they have an independent frame number. They are referred to as the port or starboard exposures associated with the forward looking or aft looking panoramic camera frame. Port is defined as the left side of the vehicle as the observer faces in the direction of flight and starboard is the right side.

### INDEX (TERRAIN) CAMERA

The index camera is a frame camera which provides vertical small-scale photography. It may be used for rapid correlation and indexing of main panoramic photography. The index camera also provides conjugate imagery for a relative orientation between the index and main panoramic cameras. This is necessary for eventual adjustment of attitude data (pitch, roll, and yaw) between the stellar and main panoramic cameras. The index camera is preset to operate at 9.375, 12.5, 15.625, or 18.75 seconds per cycle; based on the planned camera altitude, it can be programmed to operate independently from the panoramic cameras.

The terrain format is shown in Figure 7. Figure 8 shows the data block details and the start of operation marks.

#### Index Camera Data

Table 4. Index Camera Data

|                |   |
|----------------|---|
| Lens           | f4.5 T/6.75 AWAT                                      |
| Focal Length   | 3 inches  |
| Field Angle    | 74 deg  |
| Shutter Speeds | 1/250, 1/500 sec                                      |
| Shutter Type   | Rotary, efficiency 57%                                |
| Reseau         | Glass plate with 2.5mm interval grid                  |
| Format Size    | 4.5 by 4.5 inches                                     |
| Filter         | Wratten 12  |
| Film Load      | 5 in by 2,000 ft                                      |
| Frames         | approx 4800   |
| Overlap        | 68 to 80 percent between 80-120nm for 9.375 sec/cycle |

Table 4. (Continued)

|              |   |
|--------------|---|
| Cycle Period | 9.375 sec/cycle<br>12.5 sec/cycle<br>15.625 sec/cycle or<br>18.75 sec/cycle       |
| Scale        | 1/2,432,000 at 100 nm altitude  |
| Coverage     | 22,700 sq/nm per frame at 100 nm altitude; 30 X 10 <sup>6</sup> sq/nm per mission |

#### Titling Data

Present plans call for titling each frame sequentially from 1 thru n for any given pass. Frame count would then start at 1 for the first frame of the next pass. Titling data would consist of mission number, pass number, frame number, date and classification.

The reseau grid forms a calibrated array of points on the photograph which may be used as an aid in correcting the effects of film shrinkage, lens distortion, and atmospheric refraction.

### STELLAR CAMERA

Stellar photography provides a means for very accurate determination of pitch, roll, and yaw during operational cycles. One stellar photograph is pointed out either side with the optical axis 10° above the horizontal. A reseau is provided to correct for image distortion and to recover geometric orientation.

#### Stellar Camera Data

Table 5. Stellar Camera Data

|                |                                       |
|----------------|---------------------------------------|
| Focal Length   | 3 inches                              |
| Field Angle    | Approximately 23½°                    |
| Format Size    | 1.25 inch diameter with flats         |
| Film Type      | 3401                                  |
| Film Load      | 35mm by 2000 feet                     |
| Frames         | approx 16000                          |
| Reseau         | Glass plate with 2.5 mm interval grid |
| Shutter        | Rotary                                |
| Knee Angle     | 100°                                  |
| Max Distortion | 15 microns (R) 5 microns (T)          |

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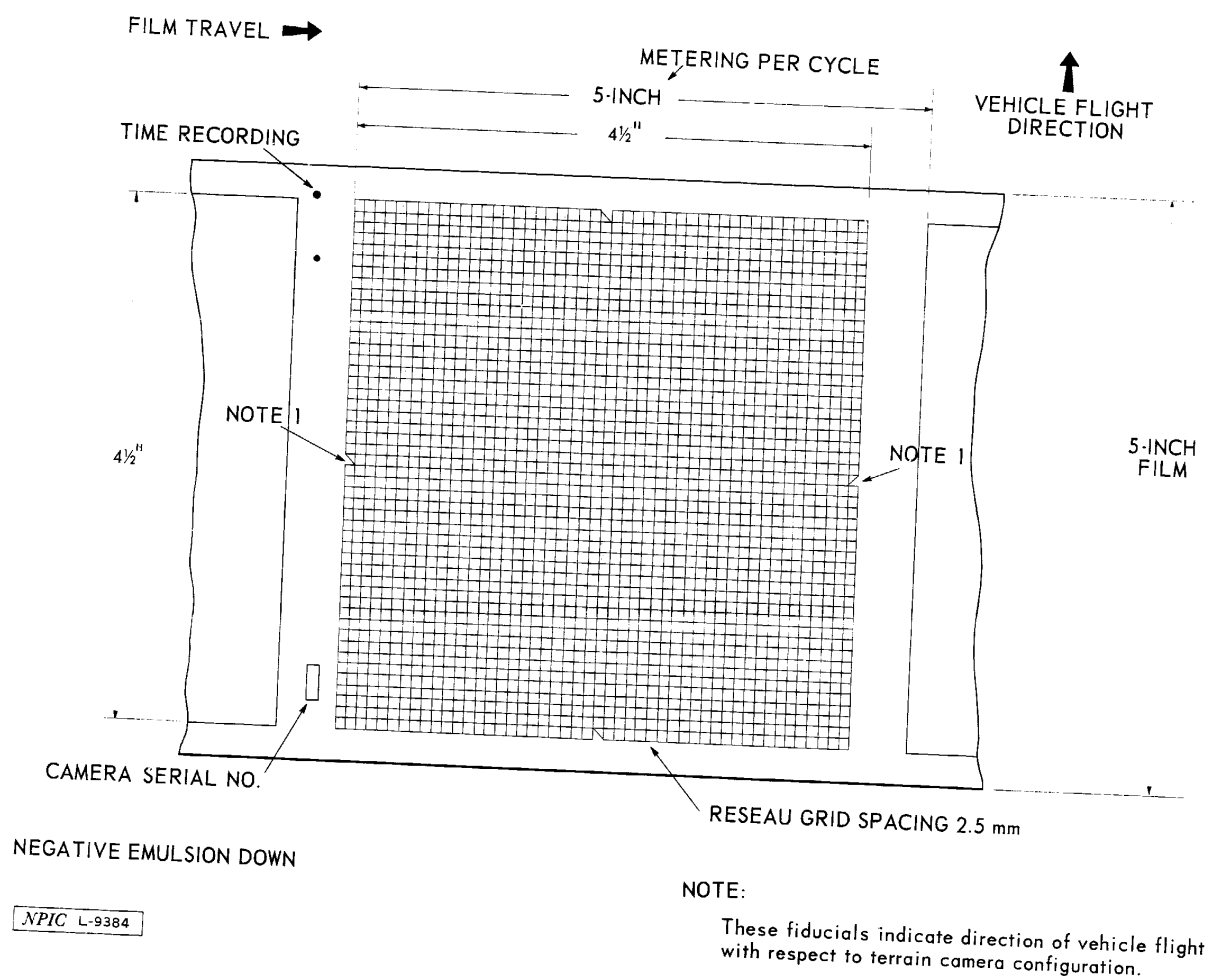


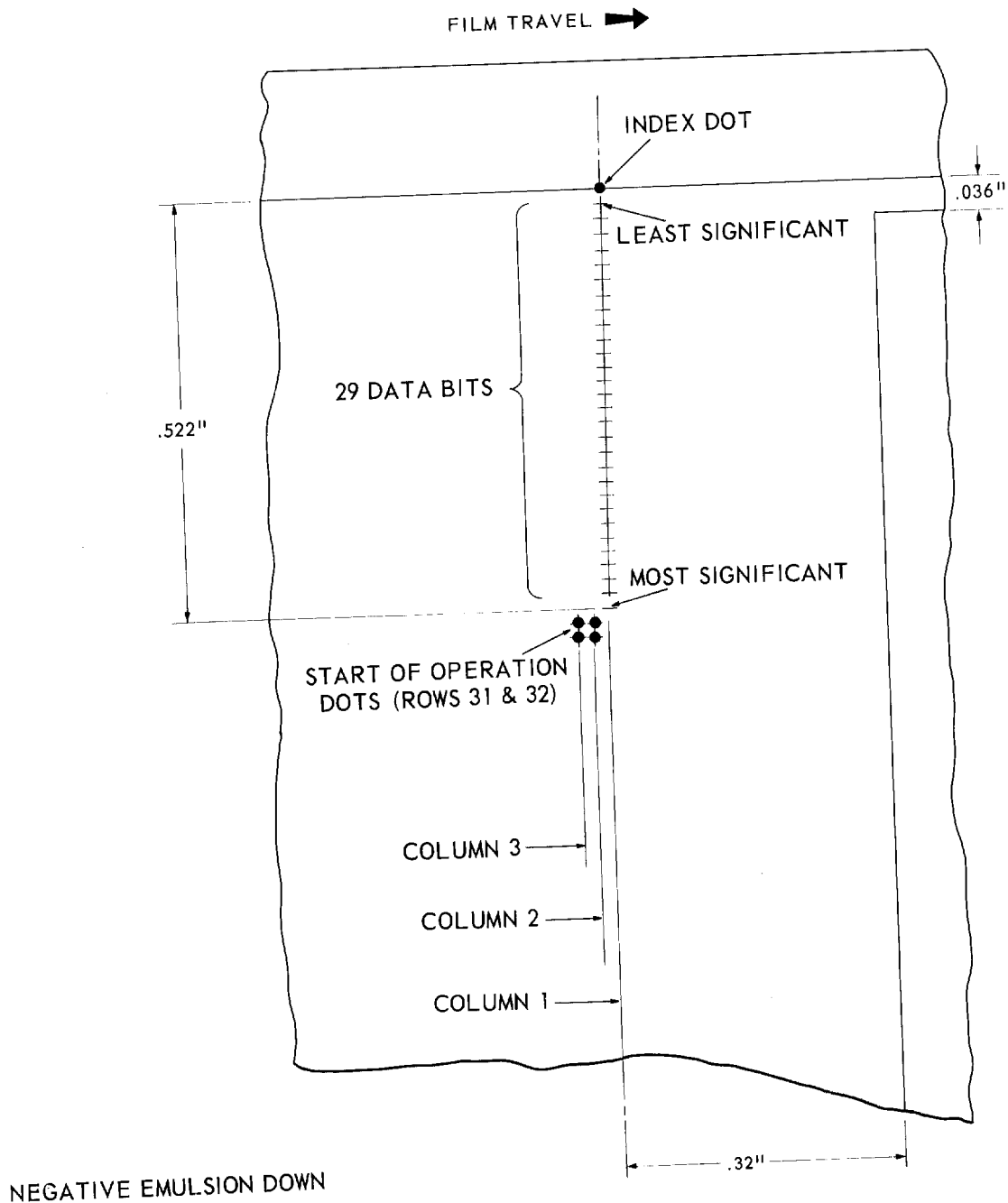
FIGURE 7. TERRAIN FORMAT.

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NPIC L-9385

FIGURE 8. TERRAIN FORMAT DATA BLOCK.

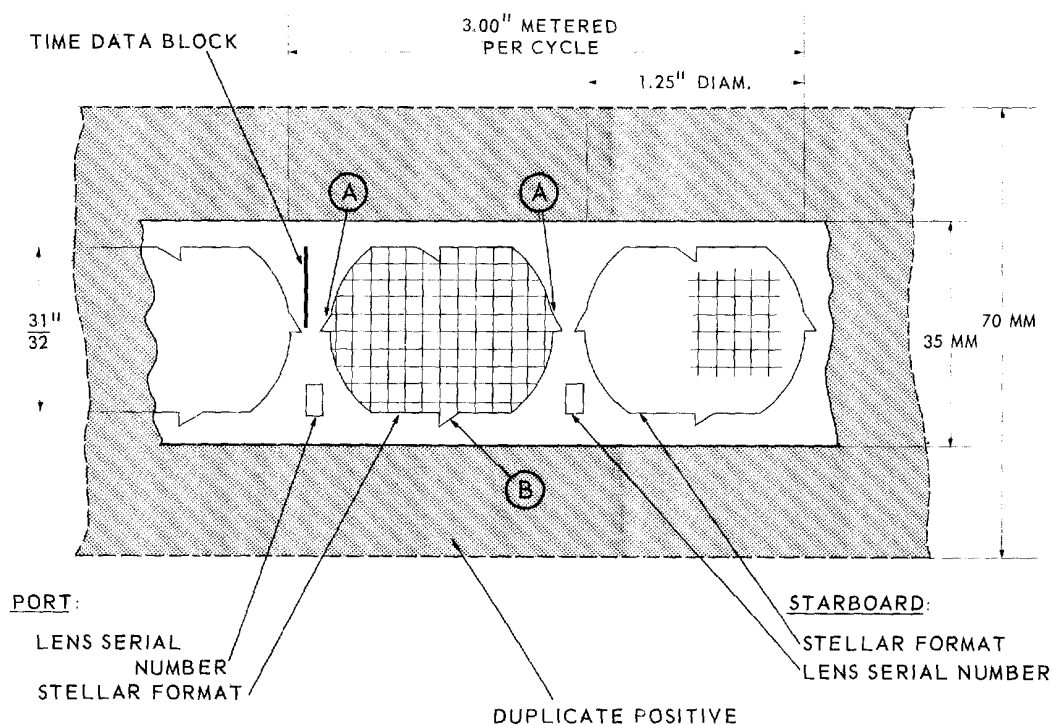
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RESEAU GRID SPACING 2.5 MM

NEGATIVE EMULSION DOWN

FIDUCIAL INDICATIONS:

- (A) VEHICLE FLIGHT DIRECTION
- (B) FILM METERING

NPIC L-9336

FIGURE 9. STELLAR CAMERA FORMAT.

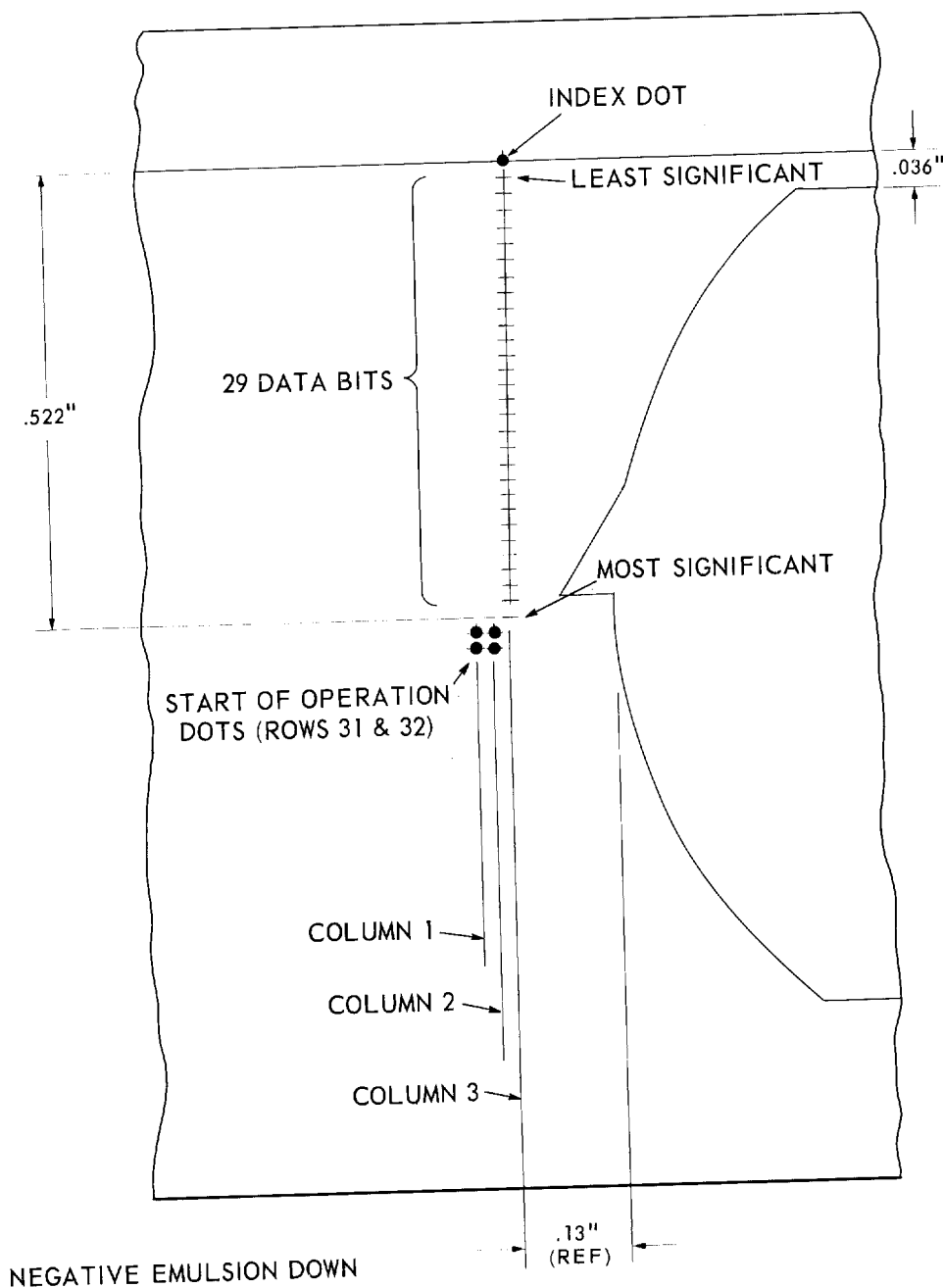
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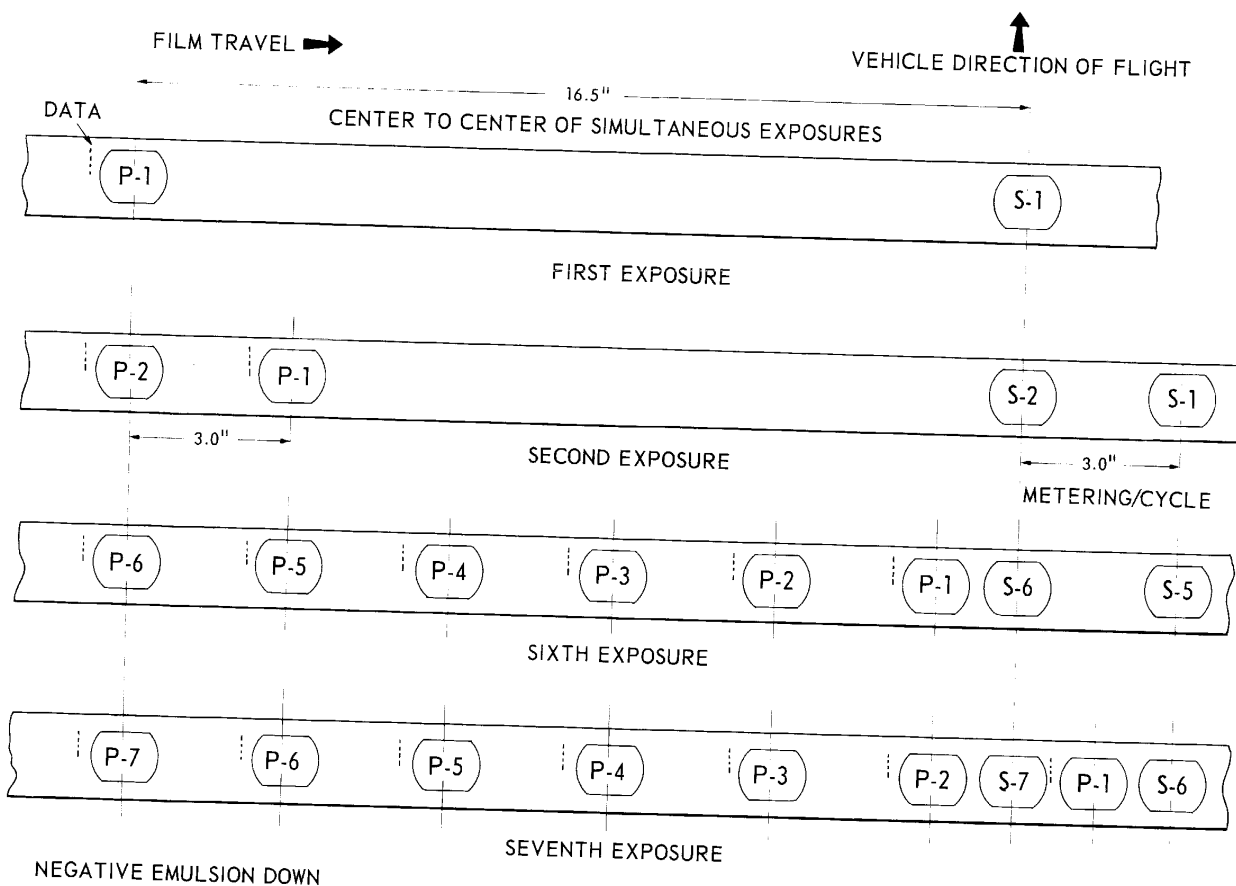


NPIC L-9387

FIGURE 10. STELLAR FORMAT DATA BLOCK.

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NPIC L-9388

FIGURE 11. STELLAR 35 MM FILM FORMAT.

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Either of the stellar cameras can be capped if a light source (which could degrade the imagery from the other camera) shines directly into the lens.

The stellar camera cycle period is 3.125 seconds, while the terrain camera is operating in the dependent mode. When the terrain camera is operating independently, the stellar camera operates once for each terrain exposure. The lens serial number for each stellar camera is exposed on the format (see Figure 9). The time word is exposed adjacent to the port serial number. The port serial number is further identified by a "P" after the number. Start of operation marks are

exposed adjacent to the time word as shown in Figure 11.

Although the stellar imagery is originally produced on unperforated 35mm film, it is customarily reproduced on 70mm duplicate positives for ease of handling by specified users as shown in Figure 9.

Present plans call for titling each port and starboard frame sequentially from 1 thru n for each recoverable subsystem of a mission. Each port frame number is preceded by a P and each starboard frame number is preceded by a S. On the leader of the stellar film is a listing of the passes and their corresponding frames.

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HISTORY OF USIB ACTIONS RE  
KH-4 (CORONA) REQUIREMENT

*File: RI's  
C Book*

USIB-D-33.6/8, COMOR-D-13/0, 29 June 1960

4. On 10 November 1958, the Acting Chief of Staff, Intelligence, USAF, forwarded a memorandum to ARPA, ARDC, BMD, and SAC, subject, Intelligence Requirements for SENTRY.

5. On 29 June 1960, [ ] Chairman of the USIB Satellite Intelligence Requirements Committee, forwarded a memorandum to the Secretary of USIB, Subject, Transmittal

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GROUP 1  
Excluded from automatic  
downgrading and  
declassification

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of Intelligence Requirements for Satellite Reconnaissance Systems of which SAMOS is an Example. [ ] memo states that these requirements are based upon the SENTRY requirements, and that they reflect recommended changes made by the USIB on 28 June 1960.

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[ ] memo recommends that the requirements be signed by the Chairman, USIB /Mr. Dulles/, and forwarded to the Secretary of Defense. Of interest, is the fact that the memo has a footnote which states that the OSD Member of [ ] committee "suggests" the requirements be forwarded to the OSD Member of the USIB, instead of the Secretary of Defense.

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6. The record is not clear, but it appears these requirements were approved by the USIB. The following statements have been abstracted from these requirements:

"The USIB considers it essential to develop and maintain an operational satellite reconnaissance system with a wide range of capabilities...the photographic system must be capable of obtaining coverage of denied areas at object resolutions of approximately 20 feet, 5 feet, and ultimately [ ] the system must provide for repeat coverage of targets at these various resolutions, depending upon the nature of the target and the intelligence problem involved... the periodicity of this repeat coverage will also depend upon the targets and situations...the anticipated frequency can be predicted more precisely as the intelligence situation develops... at present, [ ]

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[ ] but the system should have sufficient flexibility to permit coverage to be timed to meet the needs of the specific intelligence situation as it develops... our first and most urgent priority requirement is for a photographic reconnaissance system capable of locating suspect ICBM launch sites...it is our strong belief that our best chance of detecting these sites [ ]

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[ ] a maximum effort must be made

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to find Soviet operational launch sites before the end of 1962...once any ICBM is located, a satellite system with adequate ground resolution should be able to maintain surveillance and report changes in its status... to find the Soviet operational sites our highest priority effort should be directed to a general search of a

25X1 [redacted] 25X1  
[redacted] photographic resolution to accomplish this search mission would need to approach [redacted] 25X1  
on a side...repetition of this general search at the rate of approximately once each month initially would give us a relatively high degree of assurance of providing the information required...", etc.

USIB-D-41.5/12, COMOR-D-57/2, 13 August 1962

7. On 5 June 1962, Dr. Joseph C. Charyk, D/NRO, sent a letter to the Chairman, USIB / Mr. McCone/, subject, Relationship Between the NRO and the USIB. Dr. Charyk noted the role specified for the USIB in the 2 May 1962 DOD-CIA Agreement is one of establishing requirements and priorities. He added that both the COMOR and the SIGINT Committees appeared to be partially concerned with this Task, with some overlap in their areas of interest. He suggested one group be charged with photographic priorities and requirements and the other with SIGINT, since these technical areas required personnel of different knowledge and experience. He concluded with a request for the Chairman, USIB, to advise him which USIB Committees he should look to for guidance on requirements and priorities. Dr. Charyk signed this letter as D/NRO.

8. On 27 July 1962, Dr. Charyk sent a second letter to Chairman, USIB, subject, NRO Interface with the USIB. Dr. Charyk noted the NRO is chartered to respond only to USIB requirements in conducting the NRP and he stated a good working interface should be established between the USIB and the NRO. He said that within the NRO, the establishment and maintenance of the NRO interface with the USIB, and the coordination of all peripheral reconnaissance activities of the U. S. with the missions of the NRP are the responsibilities of the NRO Staff. Accordingly, he recommended the Chairman,

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USIB, consider designation of the Deputy for Operations of the NRO Staff as an ex officio member of COMOR. He added whether there should also be ex officio membership from the NRO Staff on the USIB SIGINT Committee would seem to depend upon the use to be made of that committee in regard to NRP projects as discussed in his memo to Chairman, USIB, dated 5 June 1962. Of interest is the fact that Dr. Charyk signed this letter as Under Secretary of the Air Force viz D/NRO.

9. On 13 August 1962, General [redacted] the Director's Assistant for Coordination, after reviewing Dr. Charyk's two letters to Mr. McCone, recommended to the Director: (a) current requirements for satellite systems should be prepared forthwith, (b) the requirements should include photographic, SIGINT, and mapping and geodesy, (c) based upon the responsibilities assigned to COMOR under DCID No. 2/7, COMOR appeared to be the appropriate element to handle all three, provided NSA and DIA support was added to COMOR, and (d) COMOR should accordingly be augmented with NSA and DIA membership.

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NRO

10. That same day, the Chairman, USIB, sent a letter to D/NRO, subject, Relationship Between the NRO and the USIB. In his letter, Mr. McCone stated the USIB and COMOR were undertaking as a matter of priority an updated statement of current collection requirements and priorities for overhead reconnaissance. [ no reference was made to the D/NRO's query re COMOR vs. SIGINT Committees ] Mr. McCone then approved D/NRO's proposal for NRO ex officio membership in COMOR by saying D/NRO should designate a representative to act as a "consultant and observer".

11. The USIB approved the Chairman's above response to D/NRO on 13 September 1962.

USIB-D-41.14/4, COMOR-D-48/20, 28 January 1963

12. Circa 28 January 1963, during a discussion on whether or not to resume the ARGON Program, the DIA member of the USIB raised the question of the adequacy of USIB requirements for satellite

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reconnaissance which had been provided to the NRO, especially as to guidance on frequency of coverage. After a general discussion, including comments by the Chairman, the DIA and Navy members, Mr. Reber, Dr. Scoville, and Lt. Col. Henry Howard, the USIB requested COMOR to present to USIB on 30 January 1963, if possible, an up-to-date statement of intelligence requirements which would provide adequate guidance to NRO for the next 18 months--such a statement to include guidance as to the frequency of coverage and relative priorities.

13. The above USIB decision was duly transmitted to Mr. Reber, Chairman, COMOR, as USIB Action Memorandum 63/5, dated 24 Jan 1963. This USIB AM also referred to "previous USIB actions contained in USIB-D-41.5/2, 13 August 1962 / Mr. McCone's letter to Dr. Charyk above/, and to USIB-D-41.5/19, 14 Sept 1962 the formal USIB approval of Mr. McCone's letter.

USIB-D-41.14/8, COMOR-D-48/23, 7 February 1963

14. On 7 February 1963, in the course of discussing a "related matter," the subject of requirements for NRO again arose, and again the Chairman, USIB, requested the COMOR to prepare requirements. A second USIB Action Memorandum was levied upon COMOR, USIB AM-63/7. This time a new deadline was set for COMOR action, 6 March 1963.

USIB-D-41.14/27, COMOR-D-13/3, 19 April 1963

15. On 19 April 1963 / about 34 months after the SAMOS requirements, or 8 months after the original USIB request to COMOR/, the Chairman, COMOR, submitted to USIB for approval five papers:



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- c. USIB-D-41.14/30, COMOR-D-13/6.



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- d. USIB-D-41.14/31, COMOR-D-13/7.  
CIA Views on Priority Phasing and Search and  
Surveillance Requirements
- e. USIB-D-41.14/32, COMOR-D-13/8.  
Protection of Satellite Reconnaissance Vehicles  
now redesignated COMOR-D-13/60-1, 13 April 1966

USIB-D-41.14/36, COMOR-D-13/9, 25 April 1963

16. Circa 25 April 1963, the USIB considered the above 5 COMOR papers and took the following actions: (a) noted the Chairman, USIB, announcement that a select panel of U.S. Government and non-government specialists was being organized at his direction to examine the feasibility of and to develop recommendations for immediate action regarding the timely improvement in the capabilities of both existing and future photographic satellite reconnaissance systems to meet U.S. intelligence needs, (b) agreed it would be desirable to obtain NRO views on the 5 COMOR papers prior to further consideration by USIB, (c) noted the Chairman, USIB, would work out a timetable relating, insofar as possible, the above NRO review with that of the select panel.

30 October 1963

17. On 30 October 1963, after reviewing the 5 COMOR papers, Dr. McMillan, D/NRO, wrote a long letter to the Chairman, USIB. Dr. McMillan noted the COMOR papers encompassed three general tasks of mutual USIB/NRO interest. He felt the most important was a studied estimate of the quality, quantity, and frequency of coverage that was required, and the relative priorities of each.

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This estimate should cover a period of at least 18 months ahead. The second task was a continuing short-term guidance from USIB on tasking existing capabilities. The third concerned "all recommendations outside the two areas above," i.e., "while it was the responsibility of the NRO to determine the design of reconnaissance systems, such responsibility involving evaluation and choice between the many technical trade-offs in the development and engineering process," the NRO would be happy to receive and consider any pertinent recommendations in this third area that "our associates" might wish to offer. These, however, must be considered on their individual merits by the NRO in carrying out its responsibilities. Within the present COMOR papers /the 5 papers referred to above/ Dr. McMillan felt all three of these tasks or areas of mutual interest were combined. "Since our main concern at present is the establishment of a current USIB statement of requirements, we have extracted all statements of such requirements contained in these papers, and for reference, forwarded them herewith as Attachment 1." Dr. McMillan also attached a brief summary of his comments on the COMOR requirements /these were not included in the file/. He went on to say, in general, there was much usefulness in the requirements, however, there were a number of areas which required more quantitative estimates, and he felt the requirements should be revised further prior to final acceptance by the USIB and subsequent program action by the NRO. He concluded by recommending the requirements be kept separate from statements of tasking and any "other recommendations" which COMOR and USIB might wish to make.

USIB-D-41.13/10, COMOR-D-13/14, 24 July 1964

18. In the USIB meeting, circa 24 July 1964, Mr. McCone pointed out that in February 1963, in an effort to update the 1960 requirements paper /the SAMOS requirements paper/, USIB had asked COMOR to review the problem and to recommend new requirements which would provide current guidance to the NRO. . . in September 1963, the NRO had expressed reservations concerning the COMOR requirements /see Dr. McMillan's letter above/ and the Chairman, USIB, stated he had arranged a series of meetings in which representatives of NRO presented NRO views to COMOR /chaired by Mr. Reber/. Mr. McCone noted some progress

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toward resolution of divergent views had been made until Deputy Secretary of Defense Gilpatrick requested DIA furnish long range requirements for satellite reconnaissance. Mr. McCone observed that since that time, there had been little progress in preparing requirements. He recalled that on 18 March 1964, Dr. McMillan had briefed USIB on the NRO program and plans. Lengthy discussion then ensued. USIB then issued another "directive" to COMOR:

- 25X1
- a. Prepare recommendations for future intelligence requirements, taking into account experience with the KH-4
  - b. Instruct NPIC to conduct an analysis of the extent to which specified Essential Elements of Information can be made by improved resolution and quality of photography.
- 25X1
- 

- f. Evaluate the value of an interim system built around LANYARD.
- g. Determine the relative importance and priorities of the above.

USIB-D-41.13/11, COMOR-D-13/16, 27 July 1964

19. This paper, titled Long Range Requirements for Satellite Photographic Collection, is in response to Mr. McCone's directive above. It contains six conclusions and one recommendation all of which were approved by USIB on 29 July 1964. These were:

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- a. Conclusion. There is a requirement for search and surveillance of the complete Sino-Soviet area with a resolution which will permit interpretation of objects

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- b. Conclusion. There is a requirement for photography on the order

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- c. Conclusion. There are many advantages for a system which had continuous stereoscopic ground coverage equivalent to KH-4

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- d. Conclusion. There are advantages in a system with a capability even with a swath Although the number of targets for such a system is relatively small, its ability to provide additional information on less critical targets is a bonus.

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e.

f.

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- a. Recommendation. Developmental work should proceed urgently toward the achievement of: (1) a single capability for search and surveillance with a continuous stereoscopic ground coverage equivalent to KH-4

approved by USIB  
on 29 July 1964

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USIB-D-41.13/12, COMOR-D-13/7, 29 July 1964

20. At the 29 July 1964 meeting of USIB, Mr. Reber, Chairman, COMOR, opened his discussion of COMOR's requirements by explaining his recommendation for a single capability for search and surveillance with a continuous stereoscopic ground coverage equivalent to KH-4

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[redacted] did not presume to judge the suitability of any particular system in meeting USIB requirements for an advanced satellite system. Likewise, in paragraph 7a (2)

[see Recommendation a in paragraph 19 of this paper above], although the specifications appeared to point to [redacted] COMOR was not endorsing any system, but was looking for a resolution of [redacted] if feasible, a swath as wide as possible, accuracy in pointing the camera, and continuous coverage stereo.

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21. The DIA member [Gen. Carroll], in referring to COMOR's conclusion re LANYARD, stated he did not feel COMOR had given adequate consideration to USIB's directive regarding the need for an interim search system like LANYARD. The DCI agreed and said he would like the NRO and COMOR to study the feasibility of running one or two KH-6 missions [redacted]

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[redacted] - The Chairman said that after considerable thought on the matter, he believed the positions developed by COMOR were logical and understandable. He said he understood and was fully sympathetic to the Department of Defense's responsibilities and desire for the highest possible resolution in order to produce the best technical estimates on Soviet weapons systems. On the other hand, Mr. McCone said he recognized the high priority placed by CIA analysts on the broad view of Soviet progress which could better be answered by broad coverage. The Chairman said he was not going to try to resolve this apparent problem as he believed we needed both capabilities - [redacted]

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25X1 The Chairman pointed out that only when research and development is completed can we prove or disapprove their capabilities and approve a "go ahead" on [ ] these systems.

25X1 22. Mr. McCone then reviewed the substance of a letter he had written to Deputy Secretary of Defense Vance on 23 July in which he had recommended certain steps be taken to [ ]

NRO [ ] Specifically, Mr. McCone had recommended research and development [ ] and the CIA concept over the next 6 months as a basis for further decisions. He said if the Board generally agreed to this procedure, he would meet with the Secretary of Defense and arrive at definite decisions on how to proceed. Mr. McCone said he was particularly interested in the effect TITAN III might have on future satellite reconnaissance systems. He then requested the D/NRO to make a study regarding the potential of TITAN III in improvement of systems currently under study.

25X1 23. The DIA member said he subscribed to the Chairman's proposal as he believed it necessary and appropriate that the Board state firm requirements for collection systems. Mr. McCone noted that having stated intelligence requirements, the problem of how to fulfill them was beyond the province and competence of USIB. The D/NRO stated it was very helpful to have a firm statement of current USIB requirements--The CIA member, in connection with the discussion of the weight carrying capacity of the TITAN, [ ]

25X1 [ ]  
25X1 [ ] -The DD/S&T asked whether, in view of the Board's interest in high resolution, our requirements should stop at [ ] or go down to [ ] The Chairman suggested finding out what this improvement would cost before we go further, as he was becoming increasingly allergic to requirements which did not bear a price tag-- Dr. Wheelon explained that the CIA general search proposal which was pegged to the use of TITAN II [ ]

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[REDACTED]

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24. After further discussion USIB:

a. Approved as guidance to NRO the COMOR Conclusions and Recommendations, subject to the reservations expressed by the Chairman and the DIA member concerning the COMOR Conclusions re LANYARD.

b. Noted the DCI's review of the substance of a letter to Secretary Vance re steps to improve or develop [REDACTED] and the CIA concept for a new search system, and alternative high resolution spotting and search systems in anticipation of the availability of TITAN III, with which USIB expressed general agreement.

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c. Requested that NRO report at the next regular USIB meeting on the results of the NRO feasibility study to conduct one or two KH-6 missions [REDACTED]

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d. Noted that the D/NRO would have studies on the use of TITAN III.

USIB-D-41.14/198, COMOR-D-13/22, 30 October 1964

25. In the 28 October 1964 meeting of USIB, Mr. McCone referred to a discussion he had had with the Secretary of Defense in which Secretary McNamara indicated his impression that there were no general requirements for CORONA-J missions. Mr. McCone said this surprised him very much since USIB had reviewed J coverage almost every week and had recently requested a step-up in the tempo of coverage. The DCI said he was confident there was some statement of requirement or need. In looking at the record, he noted that when the J was replacing the CORONA-M, he had raised the question as to how much coverage would be needed, since the J coverage provided about twice the film in the M. Mr. McCone noted that a CIA study, dated 11 September 1963, on this question indicated that [REDACTED]

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J missions in a 12 month period should meet intelligence requirements. Mr. McCone said that since at that time a J could not be expected to be as reliable as the M, he had recommended [redacted] The Chairman said he was under the impression that these had also been the view of the USIB. He questioned as to whether there was any difference on this point around the Board table. The DIA member, Gen. Carroll, said he did not know exactly what the Secretary of Defense had in mind. Gen. Carroll said that USIB had not given the NRO a fully adequate statement of intelligence requirements on this subject. He noted USIB had tried to develop long range requirements over a year ago (USIB-D-41.14/27, COMOR-D-13/3) [paragraph 16 above]. Gen. Carroll noted also that the USIB had recently provided a current statement of requirements (USIB-D-41.13/11, COMOR-D-13/16 and USIB-D-13/12, COMOR-D-13/17 [para 19]. He felt, however, that there was a need for longer term intelligence requirements, which he thought COMOR was studying. The Chairman proposed, and the Board concurred, that COMOR proceed on its study and submit recommendations on long term requirements.

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USIB-D-41.14/213, COMOR-D-13/29, 14 December 1964

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26. On 14 December 1964, COMOR submitted to USIB requirements titled [redacted]

[redacted] These were transmitted to the USIB by a covering memorandum from the Secretary of USIB. In his covering memorandum, [redacted] stated the COMOR paper was in response to the DCI's 28 October 1964 request for requirements [para 25], however, originally stemmed from USIB's 7 February 1963 Action Memorandum [which had set a 6 March 1963 deadline]. The covering memorandum stated COMOR was recommending as USIB guidance to the NRO "requirements for search (area coverage) and surveillance--technical (target coverage) in reaffirmation and amplification of the recommendation in COMOR's July 1964 requirements paper [para 19]. The covering memorandum went on to say COMOR recommended additional requirements regarding: (a) collection during periods of crisis and special events, (b) [redacted] (c) [redacted] d) bomb damage assessment, and (3) mapping, charting and geodesy. Finally, it stated the new COMOR requirements constituted a replacement of the 5 COMOR papers submitted to USIB in April 1963 [never approved by USIB/ with respect to [redacted]

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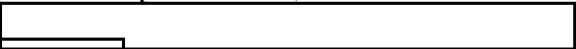

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USIB-D-41.14/214, COMOR-D-13/30, 30 December 1964

27. The new COMOR Long Range Requirements paper (para 26) was addressed by USIB at its 23 December 1964 meeting. The DCI opened the discussion with the statement that he was concerned by the paper lest it be interpreted as "an unlimited statement of requirements." After lengthy discussion, the record shows USIB:

- a. Discussed but did not approve or note USIB-D-41.14/213 for the time being. /i. e., the new Long Range Requirements paper/
- b. Agreed the NRO should complete its study and comment on the adequacy of the type of information provided in the paper as guidance for operations of the NRP, as well as on the number of missions, research and development effort, and costs which might be involved.
- c. Remanded the paper to COMOR to prepare, in light of the above discussion and with full consideration of the views of their respective principals, two separate papers which would provide USIB guidance to NRO on intelligence requirements for:
  - (1) Use of currently available capabilities with respect to targets and frequency of coverage as well as mapping, charting, and geodesy.
  - (2) Long range or new or improved collection capabilities that require R&D, and for crisis coverage,   
 bomb damage assessment, and mapping, charting and geodesy.

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USIB-D-41.13/18, COMOR-D-13/31, 7 January 1967

28. At the 6 January 1965 USIB meeting the DCI stated it had been decided to ask COMOR, assisted by NPIC, to study in depth the meaning of higher resolution from the intelligence viewpoint, in order to provide a basis for determining how far we should go along that line in view of the very high cost of

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could be substantial cost savings--He added the NRO Executive Committee was considering a series of studies (of which the COMOR study would be a part) ultimately including a group of outside consultants.

USIB-D-41.14/216, COMOR-D-13/35, 15 February 1965

29. On 15 February 1965, COMOR submitted to USIB Requirements for [REDACTED] This paper consisted of intelligence requirements for use of current systems with respect to targets and frequency of coverage, as well as mapping. [This was COMOR's response to the USIB charge contained in paragraph 27c (1) of this paper.]

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USIB-D-41.14/219, COMOR-D-13/37, 1 March 1965

30. At the 25 February 1965 USIB meeting only partial consideration was given to the 15 February 1965 COMOR Requirements for [REDACTED] paper, since neither Gen. Carroll nor Gen. Fitch were in attendance. The DCI did note the COMOR paper did not tell the extent to which objectives could be met with the required resolution in accordance with the table of DOD frequency/resolution requirements contained in Tab A of Part II of the paper. Mr. McCone felt NRO would have to furnish COMOR with information as to the number of missions which might be needed to meet the requirements specified. He said he needed this information on the number [REDACTED] in order to place in proper perspective the cost and feasibility of the DIA frequency and resolution requirements--

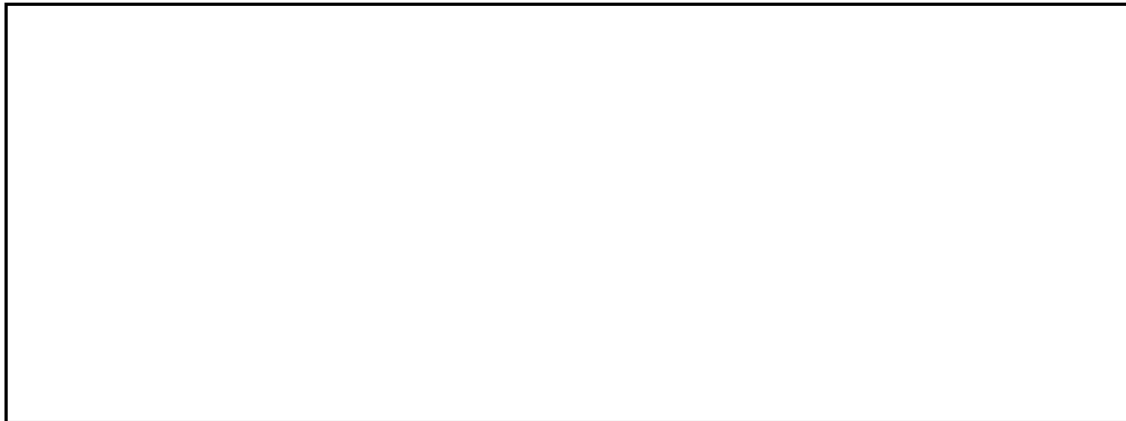
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--After further discussion, USIB:

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USIB-D-41.14/224, COMOR-D-13/40, 5 March 1965

31. As the result of the 3 March 1965 USIB meeting, USIB noted:

a. That the DIA would brief the Board at the 17 March meeting in response to questions regarding mapping, charting and geodesy, asked by the Chairman of the Acting DIA member at the 25 February meeting.  
/done/

b. That COMOR would revise its Requirements for  paper for consideration by the Board at the 17 March meeting, following the above briefing. Slipped to 24 March-- see below/

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c. The NRO would provide USIB with a firm estimate at the next meeting on the development of the pan reseau. /done/

USIB-D-41.14/229, COMOR-D-13/43, 19 March 1965

32. On 19 March 1965, the Secretary of USIB transmitted the revised Requirements for  paper to USIB members, noting the paper was scheduled on the USIB

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25X1 24 March 1965 meeting agenda. His covering memorandum stated the revised requirements were in response to USIB's 25 February instructions [paragraph 30 above], and took into account the need for a statement of [redacted] and the 17 March DIA briefing of USIB on requirements for mapping, charting and geodesy. Finally, he noted that COMOR had asked that USIB be advised that in preparing the revision, COMOR's estimate of the number of successful missions required annually had had the benefit of an extensive computer study made by the NRO. This study had taken into account the probabilities regarding weather, season of the year, light factors, and vehicle reliability.

33. The historic 19 March 1965 Requirements for [redacted] [redacted] Section I [Section II being reserved for long range requirements, which have yet to be written] consists of a paper signed by Mr. Reber and two Tabs organized as follows:

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a. [redacted]

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(1) Introduction

(2) KH-4

(i) Search (area coverage)

(ii) Surveillance (target coverage)

(iii) Frequency of KH-4 missions for search and surveillance

(3) Mapping, Charting and Geodesy

(4) [redacted]

(5) Standby KH-4 [redacted] Missions (Critical Intelligence Collection Means)

b. Tab A - Target Requirements for KH-4 [redacted]  
Including Frequency of Coverage

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c. Tab B - Analysis of KH-4  Coverage  
1961-1965

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34. As indicated by underlining in the requirements paper, the significant points were:

- a. "a reasonable effort for KH-4 is about 10 successful missions, approximately evenly spaced throughout the year for the KH-4 search and surveillance tasks"
- b. "the current KH-4 program will furnish about 12 successful missions per year, two in excess of the number anticipated necessary to meet the KH-4 search and surveillance requirement. The amount of mapping and charting photography to be obtained during the search and surveillance missions (estimated at  per mission) [should] be determined on the basis of mission-to-mission analysis of current and long term needs. Two missions annually should be utilized additionally to accelerate the fulfillment of the mapping and charting requirements [sic]."

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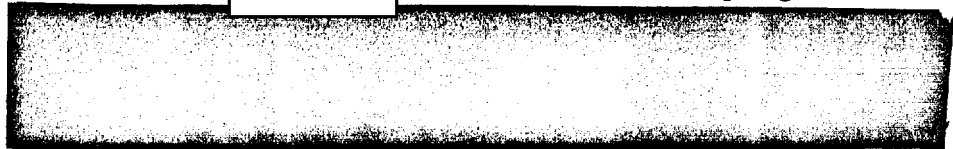
difficulty in dealing with the problem through  
such a mechanism as the USIB.

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- d. --There should be available additional KH-4   to meet periods of international tension--/ not underlined, but noted here/--until the development of special reconnaissance capabilities (explored in Section II of this paper) /yet to be done/ standby KH-4  missions should be programmed.



USIB-D-41.14/235, COMOR-D-13/45, 26 March 1965

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35. /On 24 March 1965, the revised COMOR Requirements for  paper was addressed by USIB. Mr. McCone was not present, therefore, Gen. Carter presided as Acting Chairman, Gen. Carroll was not present, therefore, Admiral Reed was the Acting DIA member. Mr. Cline, then DD/I, was the Alternate CIA member. The D/NRO was represented by Gen. Stewart. Thus, on this historic occasion, several principals were absent./

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36. "Mr. Reber, Chairman, COMOR, opened by stating the current paper took into account the mapping, charting and geodesy briefing presented by DIA at the last USIB meeting. He indicated Tab A, which had previously been at issue, had been redone and was now agreed by COMOR, which had used it as a basis for extrapolation of how many  are required and what they could accomplish . . .

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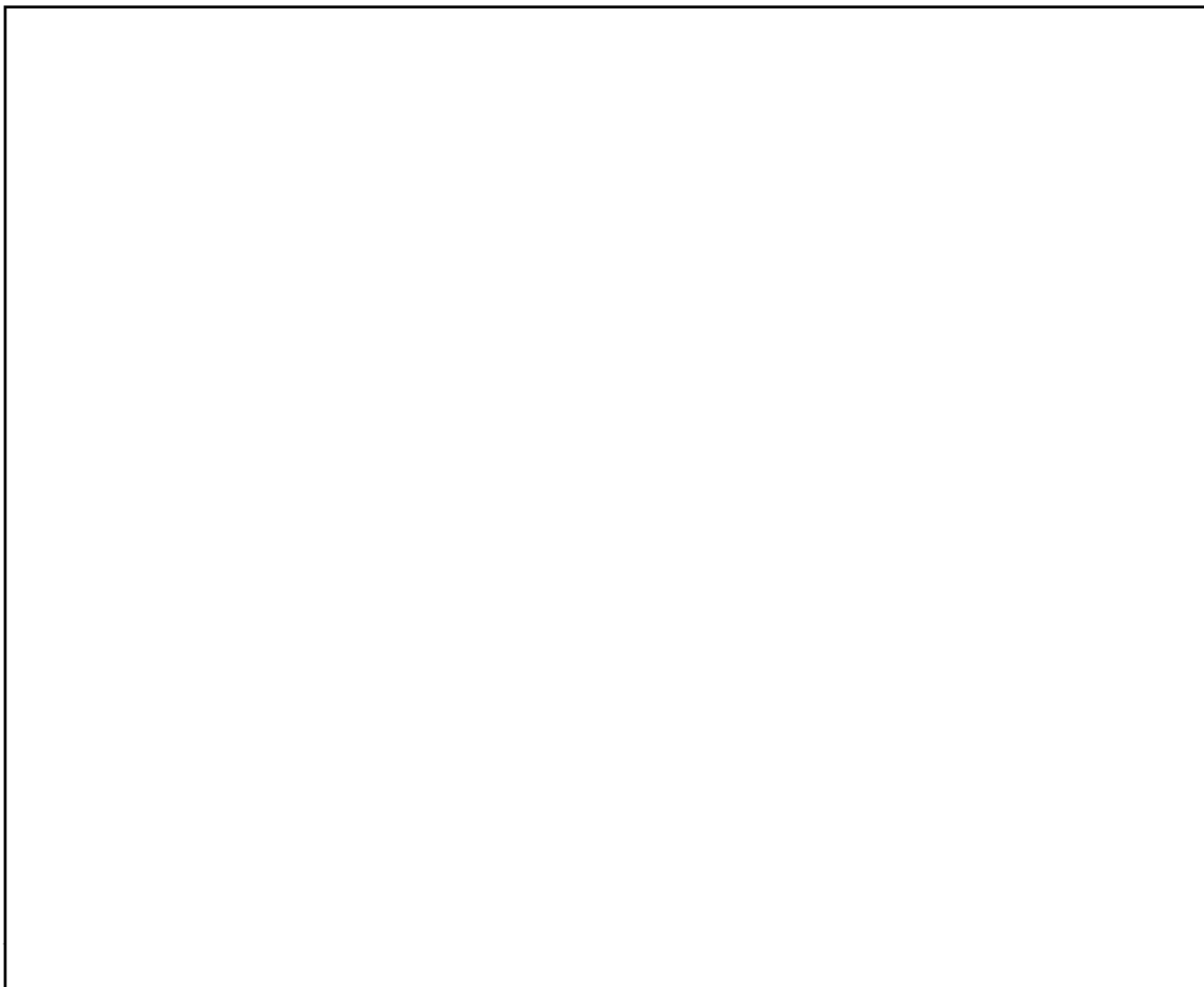
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46. After some additional discussion, USIB took the following action:

- a. Approved as amended the COMOR proposed requirements and Tabs thereto, subject to approval by the DCI.
- b. Agreed COMOR should present for USIB consideration at the next USIB meeting recommendations regarding the need for a special KH-4 M&C mission this spring.  
*[USIB approved need for this mission]*

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Memorandum to Holders of USIB-41.14/229, [redacted]  
15 April 1965

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47. At the 14 April 1965 meeting of USIB, the DCI referred to USIB's qualified approval of the COMOR Requirements [redacted]

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[redacted] He noted the requirements called for [redacted] KH-4 missions each year, primarily for search and surveillance, [redacted] KH-4 missions annually for M&C. He commented that this would call for [redacted] successful KH-4 missions annually, and noted that provision for these was being made by the NRO. Mr. McCone observed the [redacted] requirements and the number of missions referred to could be expected to cover less than 50% of the current COMOR highest priority targets because of their particular location and geographic arrangement. Mr. McCone expressed his view that the requirement as amended and approved by USIB represented a good practical program. He informed the USIB that he approved the requirement.

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USIB-D-41.14/256, COMOR-D-13/47, 7 July 1965

48. On 16 June 1965, Dr. McMillan, D/NRO, sent a letter to the Chairman, USIB, [now Admiral Raborn], subject, [redacted]

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[redacted] The first paragraph of this 3 page letter is quoted:

"I have deferred the NRO's response to this document for several weeks, in anticipation of early receipt from the COMOR of specific target decks [redacted] surveillance objectives. These decks have not yet been received. I understand that some adjustments are being made in the priorities and frequencies set forth in Tab A of the basic paper which will delay further COMOR's assembly of the detailed target requirements [thus the contentious relationship was surfaced early on with the new DCI].

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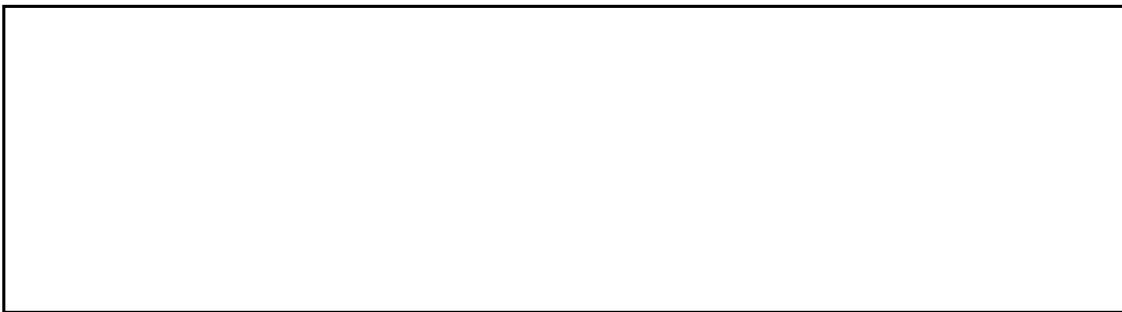
49. Dr. McMillan went on to say despite the absence of the target decks the NRO was in a position to respond to USIB's needs in the year ahead. He commended the COMOR requirements



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paper and noted it represented the first comprehensive set of KH-4 [redacted] requirements ever compiled and expressed the feeling it would be most helpful to the NRO and the Intelligence Community. He said it provided a firm basis, long needed, on which the NRO could plan and conduct an orderly and efficient operational program to meet USIB's needs.



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51. On 6 July 1965, Admiral Raborn replied to Dr. McMillan, and his first paragraph is quoted:

"I have read with interest your memorandum of 16 June. Your summary of USIB requirements is essentially accurate and I believe your plans as described are likely to meet the needs of the intelligence community as established by USIB. As you know, no one can predict with precision even the short term world situation and the associated intelligence needs. For this reason, we must maintain scheduling flexibility rather than falling into rigid patterns."

52. The DCI then went on to enumerate "guiding principles", stating they "must continue to apply". The gist of these was the principle of mission-to-mission guidance. The DCI concluded with the statement that if there were important reasons why Dr. McMillan felt these principles should be changed, Dr. McMillan should fully explain them to COMOR for its recommendation to the DCI and USIB. [The tone of this letter was icy.]

USIB-D-41.15/73, COMOR-D-48/105, 3 January 1966

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53. On 27 December 1965, Dr. Flax, D/NRO, forwarded a letter to Chairman, USIB, subject, NRP Satellite Launches [redacted]. Dr. Flax noted he had recently briefed both the COMOR and the Imagery

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Interpretation Facilities Review Group on programmed/budgeted satellite launches over the next several years. He attached programmed launches, along with explanatory notes, of both photographic and SIGINT satellites for the next four years, and he offered to brief the USIB on the material. Dr. Flax's programmed launches for CORONA were as follows:

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He included a note which stated:

"The constant rotator camera system is scheduled for launch in February 1967. By reducing random vibration, this new camera is expected to improve overall average resolution. Also, this new camera can be operated as low as [ ] thus improving resolution by the scale factor (and correspondingly reducing the swath width). This new camera system may also be able to use ultra thin base film which will increase footage [ ]

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USIB-D-41.15/78, COMOR-D-48/110, 4 April 1966

54. On 4 April 1966, the Secretary of USIB forwarded a COMOR paper, titled, COMOR Evaluation of Current Satellite Launch Program, to USIB members for concurrence. This paper notes that at its 6 January 1966 meeting, USIB directed COMOR to review the current NRO satellite launch program and to comment to USIB on its adequacy. The COMOR evaluation, which was approved by the DCI on 19 April 1966, concludes:

"a. The program for photographic satellites appears to be adequate to meet our priority needs."

b. . . . [deals with SIGINT satellites]

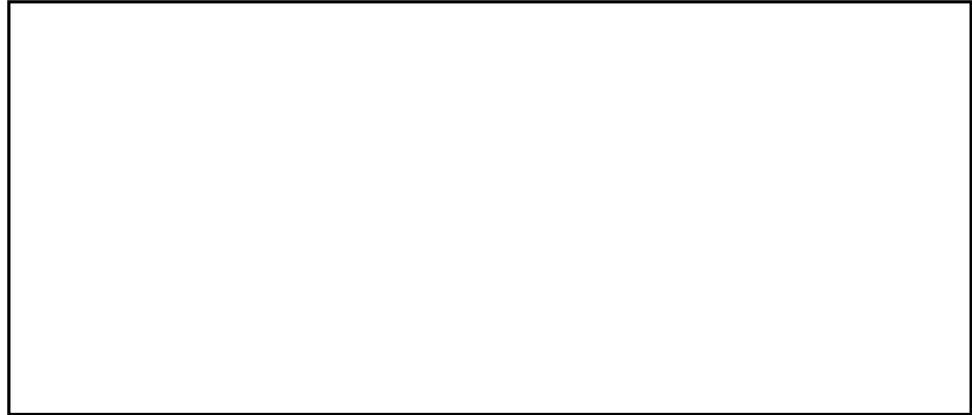
[the paper comments]

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USIB-D-41.15/79, COMOR-D-48/115, 16 September 1966

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55. On 16 September 1966, COMOR submitted to USIB a paper, titled, [redacted] Launch Schedules for FY 67. The paper states the schedules are a revision of those submitted to USIB by Dr. Flax on 27 December 1965 [see paragraph 53 above] of this paper and reviewed by COMOR on 4 April 1966 [see paragraph 54 above of this paper]. The paper states the schedules were worked out by COMOR and NRO jointly and were based upon NRO studies on the number of launches that were required to meet intelligence requirements.

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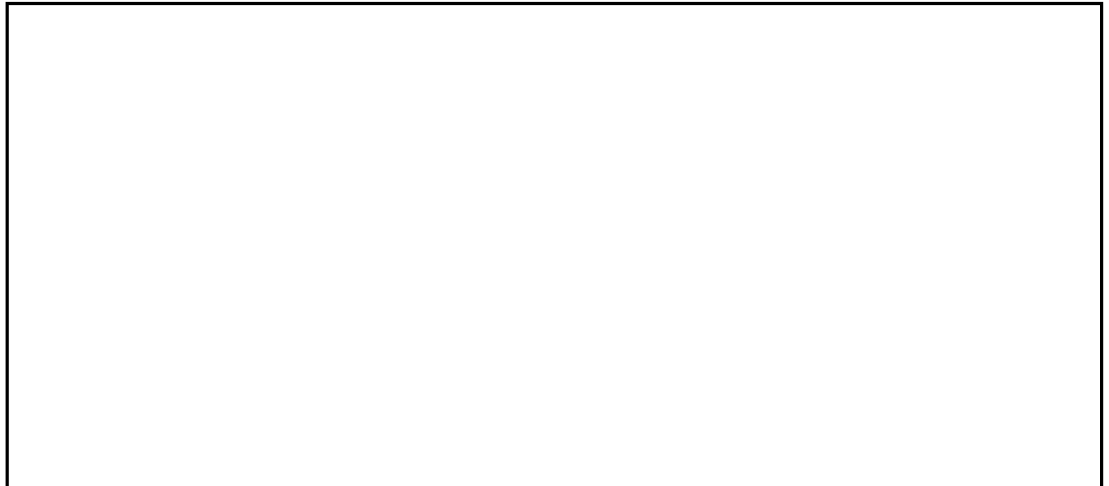


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57. [The DCI approved the above requirement on 17 October 1966, with the understanding the launch schedules would be subject to discussions between the DCI and the D/NRO. Implicit in this action, as well as subsequent Memorandum to Holders, is agreement on the recommended KH-4 schedule and search requirement, but an understanding [redacted] schedule will be the subject of continuing guidance from the DCI to the D/NRO.]

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58. To summarize the situation regarding KH-4 requirements:

a. Strictly speaking, the 19 March 1965 Requirements

[redacted] (Section I)\*, have never been formally rescinded, but is not being used by COMOR as guidance.

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b. Insofar as COMOR (and USIB) is concerned, present guidance is contained in the 16 September 1966 [redacted]

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[redacted] Schedules for FY 1967\*\*, and the Current Priorities for J Missions\*\*\* paper which is prepared by COMOR prior to each KH-4 mission.

c. The Long Range Requirements [redacted]

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[redacted] (Section II), which USIB directed COMOR prepare, has yet to be accomplished. We do have, [redacted]

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\*USIB-D-41.14/229, COMOR-D-13/43, 19 March 1965. [redacted]  
and Memorandum to Holders, 15 April 1965, [redacted]

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\*\* USIB-D-41.15/79, COMOR-D-48/115, 16 September 1966,

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\*\*\* COMOR-D-56/66 series, which is the basis of [redacted]  
programming--she obtains this input directly from the COMOR  
Photo Working Group

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All these papers have been in possession of D&AD/OSP.]